March, 1950

EDISON ELECTRIC INSTITUTE BULLETIN

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GEOGRAPHY, RESOURCES & INDUSTRIES

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PUBLISHED MONTHLY BY EDISON ELECTRIC INSTITUTE

ELECTRICAL RESEARCH STATISTICS
THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

December, 1948-1949

SOURCE AND DISPOSAL OF ENERGY—MONTH OF DECEMBER

	1949	1948	%
GENERATION* (Net)			
By Fuel Burning Plants	18,705,239,000	18,249,553,000	+ 2.5
By Water Power Plants	7,615,869,000	7,466,776,000	+ 2.0
Total Generation	**26,321,108,000**	**25,716,329,000**	**+ 2.4**
Add—Net Imports Over International Boundaries	39,400,000	75,100,000	−47.5
Less—Company Use	135,437,000	129,000,000	+ 5.0
Less—Energy Used by Producer	341,423,000	400,902,000	−14.8
Net Energy for Distribution	**25,883,648,000**	**25,261,527,000**	**+ 2.5**
Losses and Unaccounted for	3,932,471,000	3,796,421,000	+ 3.6
Sales to Ultimate Customers	**21,951,177,000**	**21,465,106,000**	**+ 2.3**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of December 31st			
Residential or Domestic	35,375,366	33,549,396	+ 5.4
Rural (Distinct Rural Rates)	1,804,415	1,694,579	+ 6.5
Commercial or Industrial:			
Small Light and Power	5,290,768	5,131,730	+ 3.1
Large Light and Power	232,125	204,230	+13.7
Other Customers	148,107	142,053	+ 4.3
Total Ultimate Customers	**42,850,781**	**40,721,988**	**+ 5.2**
KILOWATTHOUR SALES—During Month of December			
Residential or Domestic	5,600,266,000	4,958,913,000	+12.9
Rural (Distinct Rural Rates)	505,697,000	471,602,000	+ 7.2
Commercial or Industrial:			
Small Light and Power	4,047,635,000	3,822,945,000	+ 5.9
Large Light and Power	10,319,447,000	10,720,045,000	− 3.7
Street and Highway Lighting	291,120,000	269,980,000	+ 7.8
Other Public Authorities	579,880,000	557,428,000	+ 4.0
Railways and Railroads:			
Street and Interurban Railways	333,693,000	374,146,000	−10.8
Electrified Steam Railroads	221,734,000	238,393,000	− 7.0
Interdepartmental	51,705,000	51,654,000	+ 0.1
Total to Ultimate Customers	**21,951,177,000**	**21,465,106,000**	**+ 2.3**
Revenue from Ultimate Customers	**$410,417,000**	**$390,128,300**	**+ 5.2**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—For 12 months ended December 31st			
Kilowatthours per Customer	1,684	1,563	+ 7.7
Average Annual Bill	$49.68	$47.05	+ 5.6
Revenue per Kilowatthour	2.95¢	3.01¢	− 2.0

(*) By Courtesy of the Federal Power Commission.

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DISON ELECTRIC INSTITUTE BULLETIN

lume 18 MARCH, 1950 No. 3

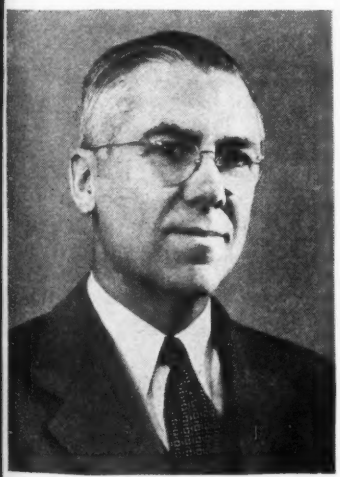
Notes on the Coming EEI Convention

Program of Genuine Vitality—Urgency of Subjects to Be Discussed—Today's Lessons: for Security Now; for Progress Tomorrow

FOR a mid-century gathering of delegates and guests that is expected to be one of the greatest in stitute history, a program of genuine ality and importance will be presented EEI's 18th Annual Convention in lantic City, June 5 through June 7. In a letter announcing this year's eting, EEI President Elmer L. Lindh emphasized the comprehensive qual- of the program and its significance to e electric industry, pointing out that here is an urgency about events that e happening today—whether they be the fields of government policies, con- vation, employee relations, financing w construction, or operating econo- es."

"It is up to us," he continued, "to e the knowledge gained from these d other developments and use it well: the security and advancement of our industry today, for its progress tomorrow."

C. E. KOHLHEPP
Chairman, Convention Program Committee



H. C. THUERK
Member, Convention Program Committee

Mr. Lindseth noted that the Convention Program Committee, headed by Chairman C. E. Kohlhepp, President of Wisconsin Public Service Corporation had kept these things in mind in planning the program, and that "our 1950 meeting should certainly be helpful in getting today's lessons turned to good account."

Turning today's lessons to good account is a theme that will be dominant in the five general sessions scheduled for the Convention. Some fifteen speakers, authorities in a variety of fields, will address the delegates on such subjects of general interest as the electric company of the future, electrical developments around the world, soil and water conservation, and problems of the coal industry. Economic and political trends and their effects and implications will also be discussed.

In addition, specific areas of electric company operations are to be covered, with addresses on the development of organization and personnel, financing and investor relations, the human factor in operating economy, farm electrification, and the effect on the load curve of some new appliances. Following the completion of arrangements, a later issue of the BULLETIN will carry the program details.

The Convention will get under way on Monday afternoon, June 5 with the first of the general sessions, to be held in the Atlantic City Convention Hall. The second general session is scheduled for Tuesday morning, June 6, also in the Convention Hall.

Tuesday afternoon the setting will be

HAROLD QUINTON
Member, Convention Program Committee

changed for the third and fourth general sessions, which will be held concurrently in two of the larger ballrooms of Chalfonte-Haddon Hall. On Wednesday morning, the Convention's business will be completed at the fifth general session, which will take place in the Convention Hall.

Midway in the mid-century meeting, there will be special opportunities for recreation and relaxation. On Tuesday afternoon, the ladies at the Convention will be guests of Hotpoint, Inc., for luncheon at the Hotel Traymore. Entertainment features are planned for this occasion, but their details have not as yet been revealed.

Pleasant relaxation on Tuesday evening has been arranged by General Electric Company, Westinghouse Electric Corporation, and EEI. The main arena of the Convention Hall auditorium will be transformed with decorative ingenuity into a gardenlike setting, in which General Electric and Westinghouse will be hosts to all Convention delegates for cocktails from 5 to 7.

A tremendous staircase, to be erected for the event, will lead from the auditorium to the grand ballroom, making it possible for the delegates to move by easy stages to supper at 7 o'clock, where they will be guests of the Edison Electric Institute.

After supper, formal presentation of the Charles A. Coffin Award will be made. A number of entertainment attractions will also be offered in the ballroom, among them the Westinghouse choral group, and arrangements have been made for dancing.

Once again, coverage of business and social events and a listing of delegates registered at the meeting will be provided by the *Unconventional Daily*, the Convention's own journal published through the courtesy of *Electrical World*.

Since the Convention will come to a close following the Wednesday morning general session, plans are being made for a special train to leave Atlantic City for New York at 4:30 in the afternoon, for the convenience of the departing delegates. The special train will make connections with regularly scheduled trains leaving from Philadelphia.

Because a large attendance is expected at the meeting, applications for hotel reservations should be made early, if desired accommodations are to be ob-

(*Continued on page* 78)

Atlantic City, its Famous Boardwalk, Piers, and Resort Hotels Seen From the Air. Hotel Traymore is in the Foreground; the Convention Hall Above the Pier.

Boardwalk Strollers in Atlantic City At the Beginning of the Century

Plans and Problems of the Industry at the Turn of the Century

CONVENTION scenes and considerations have changed in the march of fifty years, but the basic purposes of electric industry gatherings are still much the same as they were in 1900 when Samuel T. Carnes of the Memphis Light and Power Co., President of the National Electric Light Association for that year, remarked on "the natural advantages of these regular meetings for the discussion of the various practical questions that most deeply interest us," and the "further advantages of absorbing the ideas and practices of the most advanced and scientific workers in this most wonderful branch of modern science."

These words, spoken at the NELA Convention in Chicago in May, 1900, embodied a lot of confidence and faith in a young industry, scarcely 18 years old and serving only about half-a-million customers. Predecessor of the Edison Electric Institute, NELA at that time represented "in the capacity of its membership $300,000,000 invested in the development of electrical industries." (Incidentally, each of the eight largest operating electric companies in the nation today has fixed capital of over $300,000,000.)

A number of topics on the program of fifty years ago have a familiar ring today: "Operating Economies in Central Station Practice"; "Uniform Accounting"; "Report of the Committee on Standardization of Electrical Apparatus"; "Equitable, Uniform and Competitive Rates." Being pioneers in these matters, the speakers dealt with basic problems, building foundations for the refinements to follow.

In addition to the above subjects and the President's Address, the 1900 Convention heard papers on "Exhaust Steam Heating," "Central Station Economies," "Series Inclosed Alternating Arc Lamps," "Combination Electric Lighting, Power and Railway Work," "Alternating-Current Generators" and "Automobiles as a Source of Revenue to Central Stations"; committee reports on "Photometric Value of Arc Lamps," "Grounded Circuits," "Standard Candle Power of Incandescent Lamps," "Amendments to Freight Classification," "Legislative Policy" and "Theft of Current"; and finally a round table discussion was held on "Free Wiring."

It is interesting to note that of the list of speakers and committee chairmen giving reports, seven had been or were to become president of the National Electric Light Association. These were: S. T. Carnes, H. L. Doherty, James I. Ayer, James B. Cahoon, Charles R. Huntley, Dudley Ferrand and Samuel Insull.

In his paper dealing with operating economies, W. L. Abbott, chief operating engineer of the Chicago Edison Co., stated forthrightly that "the greatest possibilities for saving or wasting about a steam plant are undoubtedly in the coal pile; but as it is a dirty proposition and many of its features are not well understood, the subject does not receive the consideration to which it is entitled."

For his treatment of the matter, Mr. Abbott was praised by one of his listeners, Henry L. Doherty, who was to become NELA's President a year later, for "calling special attention to boiler results," thereby doing "a service to the entire electrical fraternity." However, Samuel Scovil, who later became President of The Cleveland Electric Illumi-

Basic Principles Put Forth at 1900 Convention

FIFTY years ago, Convention speakers and delegates were vigorously engaged in thrashing out first principles—principles which have had tremendous influence on the growth of the industry. Henry L. Doherty, in his paper on "Equitable, Uniform and Competitive Rates," gave a fair sampling of these guides to future success:

"Paradoxical as it may seem, the stations realizing the lowest income per kilowatthour were generally making the largest return on their total investment. . . .

"If we must provide for a heavy peak for one month or one night in the year, it is desirable to have as nearly as possible the same demand throughout the year . . . any system tending to depress this peak at other seasons than our maximum load, is unwise and objectionable. . . .

"We are more interested in knowing what our consumers' maximum demand is going to be, than in knowing what it has been."

Mr. Doherty also made an accurate, if understated, prediction: "Legal restrictions in central-station operations will increase rather than diminish."

In addition, years before mass-production methods and aggressive merchandising policies brought new products into every home, he stated the basis for the coming economic developments, as it applied to the electric industry: "The lower the rate at which we can give consumers current, the greater our opportunities for extending its use and finding new uses for it."

This point was emphasized by John F. Gilchrist of Chicago Edison Co., in the discussion following Mr. Doherty's presentation: "The consumer of electric light is like the consumer of anything else. If you want to sell a man electrical supplies, you must educate him to the fact that he needs electrical supplies; and you must do the same thing with electricity . . . if you are to get him from the outset, you must get him to use the current first, get him into a familiarity with the advantageous points of your system, and you must do it by a method that attracts him very strongly."

In the commercial field, a paper by Elmer A. Sperry of Cleveland, Ohio, entitled "Automobiles as a Source of Revenue for Central Stations" showed alertness to new business possibilities, but circumstances beyond his control invalidated his predictions.

"The single feature of constantly increasing cost of supply of fuel-using vehicles," Mr. Sperry said, "has already driven the makers to the extremity of seriously considering alcohol, with its weak power factor, as a possible substitute for the lighter petroleum products." He pointed to the "Total absence of either steam or gasolene (*sic*) street cars," apparently viewing this as a good omen for the future of electric vehicles using storage batteries, and foreseeing an important central-station role in battery and machinery service.

In looking back, it makes little real difference now whether a given paper was almost uncanny in its prescience or whether it was almost ludicrous in its fallibility. The earnest effort, the faith and conviction in the progress of the industry was as valid at the beginning of this tradition of dedication as it is today. The 1900 Convention brought the electric industry together on the threshold of fifty of the most eventful years the world has ever known. Since that day the industry has measured up to every demand upon it, and, with the same spirit that imbued the delegates entering the first half of the century, the 1950 convention-goers move into the second half.

nating Co., asked the speaker what his opinion was "on the question of automatic stokers." On Mr. Abbott's reply that they "show better results than hand firing," Mr. Scovil demanded "Why don't you have automatic stokers?" To which Mr. Abbott responded: "If you will ask that question in about four months I will answer that we have them."

Progressive thinking also characterized the approach to other problems of the day. A thorough-going investigation of the Photometric Values of Arc Lamps was given a lead position on the 1900 Convention program, and the Treasurer's Report notes that the cost of the study was $824.01. Whatever its value was fifty years ago, it is unfortunately true that the Committee's report today must be valued chiefly for its historical interest.

By the Sea at Atlantic City—Beachwear Circa 1900

Salesmen, the Backbone of Our Free Enterprise System

By A. E. Holloway

President, San Diego Gas & Electric Company

An address before the Annual Winter Conference of the Bureau of Radio & Electrical Appliances, San Diego, Calif., January 27, 1950

SALESMANSHIP is the art of successfully persuading people to buy a product that will be useful to the buyer, in a market wherein the buyer is free to make his choice.

Salesmanship is a direct product of our free enterprise system. The Socialistic State, the Communistic State or the Fascist State have no need for salesmen. In those countries the user has no opportunity to make a choice of purchase. In those countries we find order takers, not salesmen.

Remember this definition because later on in this talk I hope to develop the reasons why you should be proud to be a salesman.

Advertising As Salesmanship

There are many types of salesmen and also many methods of salesmanship. In discussing this subject with our advertising manager a few days ago, I told him that it is my honest belief that salesmanship is the one vocation that has made America greater than any other nation in the world. Our advertising manager stated that he believed that the advertising man was the one that has made America great. I agreed with him because I consider that advertising men are salesmen, and in order to be a successful advertising man you must understand and carry out the fundamental ideas of salesmanship. Advertising is nothing more than mass selling by appealing to the buyer through the sense of seeing and hearing. Direct or personal selling employs only two other mediums over advertising. These two mediums are personality and personal contact.

You are familiar with our modern methods of salesmanship. They may be classified as: (1) Advertising, and (2) Personal Salesmanship.

Advertising uses newspapers, magazines, radio, window and shop display, television, direct mail, display boards and in general sells through the medium of sight—and since the development of the radio and television, through the sense of sound. Advertising is an important division of selling but it must have the assistance of that division of selling which is my topic—Personal Salesmanship.

Personal Contact In Selling

Personal Salesmanship is the method by which the seller makes personal contact with the buyer, in order to complete the sale. I hope to establish the fact that personal salesmanship is the basic principle which has made our free enterprise system what it is today, and that one of the most important things necessary to continue our free enterprise system will be the development of better salesmanship in our country.

There are all kinds of salesmen and there is a need for each different type. You will recognize some of the types that I mention: the High-Pressure type, the Talkative type, the Smooth type, the Quiet type, the Flashy type, the Rough-Shod type, and the Creative type. There is an important place for each type of salesman in our economic system, depending on the article to be sold. I will not discuss all these types and their needs, but let me mention a few things to be sold. Then you can pick the type of salesman whom you think might be best suited to do the selling of: 1. The circus side show; 2. Lydia Pinkham's Compound; 3. Racing Tips; 4. Real Estate; 5. Insurance; 6. Electric Wiring; 7. Electric Refrigeration.

Fundamentals of Salesmanship

There are certain fundamentals about salesmanship that a salesman must learn before he can hope to be successful. These I rate as follows:

1. Have confidence in your ability
2. Know the value of your product
3. Study your prospects' needs
4. Tell the truth convincingly
5. Ask the prospect to buy
6. Work hard and don't be discouraged

I often compare the art of salesmanship to playing the game of golf. Other people can tell you the fundamentals of being a good golf player, but the only way you can become a good golfer is to know how to put those fundamentals to proper use. This is only accomplished by continued practice and trying.

In salesmanship, as in golf, the stance is very important. The preparation for the shot, such as a study of the surroundings, is important in both cases. The swing must be smooth, it must be aimed at the ball, and it must follow through to completion so that the ball will travel true and straight. In selling, you must survey your prospect, learn something of his needs for your product, approach him with confidence, keep your eye on the sale to be made, and then follow through to its completion.

Value of Sales Approach

As in golf, the approach is one of the most important points in making a sale. I have played with golfers who could not drive more than 125 yards. But due to a good approach, they are always up to the green in the same number of strokes that a long driver takes.

Salesmanship, like golf, requires study, requires practice, requires experience and requires confidence in your ability. Besides all these, salesmanship requires truthfulness—both to the buyer and to yourself.

To my mind, salesmanship offers the greatest opportunity for young men just starting out. It gives them an opportunity to study human nature, to come in direct contact with other people, to learn what people think, to learn how they are motivated. It gives them an opportunity to plan their own future by contacts with their fellow man.

Why is it that America, with 7 per cent of the world population, and 6 per cent of the world's land area, possesses:

80% of all the world's automobiles
50% of all the world's telephones

33% of all the world's railway mileage
30% of all the highways
60% of all the life insurance
60% of all the radios

And consumes:

75% of all the world's silk
50% of all the world's coffee
60% of all the world's rubber

Why is America the most prosperous of nations? Why does it have the greatest Navy? Why does it have the greatest industrial plants?

Basis of Greatness

The basis of our greatness has been our free enterprise system, wherein the seller has the right to sell in a free market, and the buyer has the right to choose what he buys. Salesmanship in my opinion has done more to produce this great nation than any other vocation.

What good would the invention of the electric light by Thomas Edison have been unless some salesman first sold the need for it—sold the public on investing their money in the power plants to operate it, and sold the lamps to the individual users? Salesmen made the incandescent lamp what it is today by carrying back to the engineer and inventor the need for improvements.

The Creative Salesman

Why is it that within the short time since the incandescent lamp was invented, the customer can now almost get forty times as much light for his dollar? The everlasting teamwork of salesmen and inventor has made this possible. The salesman studies his customers' needs and urges improvements in his products to meet those needs. So that instead of living under 1 foot-candle intensity today, we are using 100 foot-candles, and tomorrow we will be using 200 foot-candles as new methods are brought out. The creative salesman takes back to his factory the ideas expressed to him by the user so that his factory can keep abreast of the demand for improvements.

Creative salesmen, in my opinion, are the most important link between the producer and the user. They are the ones whose efforts sustain mass production and lower prices.

America must continue to have greater mass production in order to furnish our people jobs and the money with which to buy our products. Every man is proud of those things which he accomplished by means of his own initiative. He is proud of owning his own home and his own automobile, when they are owned by means of his work and initiative. We in America must keep this mass production and free enterprise system going at full speed in order to keep our individual freedoms. I believe that American salesmen can do more to preserve our free enterprise system than any other group in America.

In the last few years we have heard men in responsible positions say that advertising was an unnecessary expense, that salesmen are unethical and unnecessary. You and I know the men who made such statements had no idea of the things that have made America great; either that, or they had a desire to take away all the incentive a man has to be successful in this country. We salesmen must fight this ideology. I am glad to see the Advertising Association of America undertake to tell the people why advertising is necessary.

We know that we could get along without garbage disposals. The garbage man still takes away the garbage. We could get along without washing machines, too. In fact, the women might grow stronger and keep their waist lines trimmer if there were no washing machines. And we could get along without life insurance policies, because we personally will not need money when we are dead. And certainly we could get along without television sets. The point is that if it were not for some advertising or salesmanship, all of us would be getting along without a lot of things we now enjoy. We want to continue that freedom to buy and to sell. That freedom has made us a great country, and it will help us continue to be great.

Socialist Restrictions

We do not want to travel the path of Socialistic countries wherein a citizen may not build himself a house, nor change his occupation, nor open, equip and operate a business; rotate his crop; wherein a shopkeeper cannot supply what his customers desire, nor a citizen travel abroad, without more or less detailed official sanction. Socialism has no country to which it can point that has anything as good as we have in America.

I have been told that many of the young men of today are shying away from salesmanship. I am sorry to see this feeling prevail, because I myself feel that good salesmanship offers the greatest opportunity for young men to become successful, to continue to make America great, and to preserve our fr enterprise system.

Free enterprise means freedom f every individual to exert his utmost c pacity in producing and selling tho commodities and services which he think other people want, not under the lash o authority, but under the discipline o moral responsibility to the public in terest.

Governmental Give and Take

If you and I are proud of Americ proud of our state and proud of our cit let's tell the world that we are thankf we are living under our present syste Let's counter those who argue th everything is wrong with our prese system, who urge that everyone mu have complete security and that the go ernment can furnish security for a This is a philosophy of resignation an old age. We must let the people kno that government can give them back more than it takes away. We must l the people know that in order to mai tain our freedoms in this country, it up to all of us to produce more, to s more and distribute more of those goo which improve our living condition This can only be accomplished throu a free enterprise system, with everyo able to choose and buy that which wants.

"Salesmen Built America"

Mr. George Hughes, who develop the Hughes Electric Range and start the Hughes Range Company, was o of the great salesmen of our industr In 1941 Mr. Hughes published a bo entitled, "Salesmen Built America." want to read you his opening message the salesmen of America:

"All that America is, all that it hopes be, it owes to salesmen. A salesman d covered it. Christopher Columbus 'sold' Spanish queen an idea—that the world w round and the riches of the Indies were the West. He 'sold' a rebellious crew t idea of sailing on. By perservering, found America.

"A salesman gave it the spark of l Sir Walter Raleigh went from coffeeho to coffeehouse in London 'selling' the id of a land of opportunities called Virgin He fired the imagination of Englan America became more than a place to g it became a place to grow.

"A salesman gave it the urge for freedo The pamphlets and teachings of Thom Paine 'sold' the colonists the idea of a 'n freedom,' a freedom which found expres in our Declaration of Independence and o Constitution. A new force was unloosed the world. A nation was born. A salesm

(*Continued on page* 103)

The Relation Between Hydroelectric Power and Manufacturing in New England

By S. R. Knapp

Executive Vice President, The Connecticut Light and Power Company

An address before the Hartford Rotary Club, Hartford, Conn., March 13, 1950

ABOUT a month ago I attended a meeting in Chicago where there were representatives from all parts of the country. Several of them asked me about conditions in New England, and the implication was that New England was falling apart at the seams and that bread lines were a common sight in every city.

Actually there has been a net gain of over 1000 manufacturing enterprises in New England since the end of the war in 1945. In 1939 the value added by manufacturing in New England was $2,430,000,000. In 1947 it was $6,770,000,000, almost three times as much. There is no question but that a readjustment is going on among various industries throughout the country with respect to plant location. There is little evidence to indicate that this readjustment will in the long run be harmful to New England.

Exaggerated Reports of Economic Downfall

Either deliberately or otherwise, it appears that reports of our economic downfall have been considerably exaggerated throughout the rest of the country. That doesn't mean that we should be complacent about the situation. Certainly, we should avail ourselves of every opportunity to improve the competitive position in our industries — but we shouldn't be panicked into buying an expensive cure-all, when perhaps a little castor oil and good judgment is what we need.

One of the factors in the overall picture which has received considerable attention of late concerns the availability and cost of electric power in New England. Because of the numerous public statements by government officials during the past year, it is difficult to discuss this question without appearing to be embroiled in a hot political controversy. Unfortunately, at least from my viewpoint, the argument is going to wax hotter before it dies down. President Truman indicated that this is to be the case when he implied in his recent "state of the union" message that all New England needs to fix itself up economically is plenty of low cost federal power. As you know, ours is one of the few remaining sections in which the federal government has not injected itself in what is essentially a local problem.

In order to set the stage for this discussion, it is necessary to review briefly several points relative to the situation that have received wide publicity and which have therefore created the impressions now held by the public in general. Out of these points I am going to try to develop a few basic facts which will permit arriving at some logical conclusions.

During and shortly after the war, the proponents of federal power development in this area made the false claim that it was needed to alleviate a power shortage. That cry is not heard much today, because New England has plenty of power as the result of the more than half a billion dollar construction program started by utility companies as soon as W.P.B. controls were lifted at the end of the war.

New England Power Costs

More recently, emphasis has been placed on the fact that electric power costs are higher in New England than the average for the country as a whole. I am not going to attempt at this time to analyze that entire situation completely, but since public attention has been drawn to the fact that the average cost of electricity for industrial power purposes in Connecticut was 69 per cent above the national average in 1948, I would like to explore that point briefly.

There are three reasons for the substantial differential:

1. The national average includes the sales from all federal power projects, such as TVA, Bonneville, and many others, which in effect is subsidized power in that it does not include taxes comparable to those paid by the private utility industry; and it is financed at low interest rates—in many cases below that which the government pays for money and in others it pays no interest at all.
2. The national average includes large amounts of naturally low cost hydro power, such as that produced at Niagara Falls and in many areas in the Pacific Northwest.
3. There are substantial cost differentials in the facilities and materials used in the supply of electric service, the most obvious being the cost of the fuel. In 1948, according to the Federal Power Commission, the cost of fuel in New England was as much as ten times the cost of fuel used in power generation by one large plant in Texas.

Industrial Rates Compared

In order to get a truer picture of the cost of industrial electric power for the type of industry which we have in this area compared to the cost for similar types of industry in other areas, I analyzed power rates for the month of January of this year in Newark, Cleveland and Detroit, as well as in our own system. All three of these areas are highly industrialized and have many factories comparable to factories in our area.

For the typical factory using 500 to 1000 kw of power, which means one employing from 250 to 500 people, the cost of power in our area was 7.25 per cent above the average in Newark, Cleveland and Detroit. If we apply the same coal cost that existed in Connecticut to the other locations, the differential drops to 1 per cent.

The fact that the cost of power for our industries is only slightly higher than in other similar industrial areas does not mean that we shouldn't attempt to lower it if it is possible to do so. Does the answer lie in greater development of water power?

At the present time the major portion of New England's power requirements are supplied by fuel-burning steam generating plants. During the last few years there have been many charges made by proponents of federal power development that the utilities in New England had been derelict in their duty to provide adequate electricity at the lowest possible cost because of their failure to more extensively develop the potential hydroelectric power of our rivers. Furthermore, it was claimed that this situation was responsible for the migration of some of our industries to other parts of the country.

New England Water Power

Actually, water power has been developed in the New England states over a period of many years to about the same extent that it has in Tennessee where the TVA has spent almost a billion dollars, or in Washington, which is generally thought of as a state where water power has been highly developed. Factual data shows that water power developed in the New England states, exclusive of Maine, amounts to 32.2 horsepower per square mile. In Tennessee and Washington the corresponding figures are 32.3 and 32.6 horsepower per square mile, respectively.

As the result of these charges by federal power proponents, the New England Council had an exhaustive study made by the Charles T. Main Company, an outstanding engineering firm in Boston. The Council's report, issued in December 1948, indicated that there were about 420,000 kw of undeveloped water power in New England which could be developed on a sound economic basis. This undeveloped amount represents about 15 per cent of the total power requirements in New England at the present time.

On May 14 of last year, Mr. C. Girard Davidson, Assistant Secretary of the Interior, in an address in Worcester before the Textile Workers of America, said, among other things, that "the undeveloped water power in New England rivers—all alone and without assistance from steam plants—could be harnessed to produce 3 1/3 million kw."

It is not surprising that the wide difference between the Charles T. Main figure of 420,000 kw reported to the New England Council and Mr. Davidson's figure of 3 1/3 million kw only served to further confuse the issue, with the result that several other proposals have been made for a complete restudy of the whole situation.

Federal Power Commission Data

Mr. Davidson's statement was a misinterpretation of data furnished by the Federal Power Commission. That data indicates that all of the possible sites might theoretically develop altogether a little more than 3 million kw but that detailed field studies would be necessary before a firm estimate could be made. The Federal Power Commission did not claim that all of these developments were economically or even engineeringly feasible, but expressed the opinion that they warranted further investigation to determine their possibilities. At no time did the Federal Power Commission indicate in any way that New England water power "all alone and without assistance from steam plants" could fulfill New England electric power needs.

The flow of our New England rivers, even with extensive provisions for upstream storage basins, is so irregular that it can only be depended upon to take care of what we refer to as "peak loads," which occur only during a few hours of the day. Until atomic energy becomes practical for power production purposes, there can be no substitute for coal- or oil-burning plants to supply the bulk of New England's electricity.

In order to establish the limitations of our hydro power and the consequent essential need of steam power as an uncontested fact, it would be necessary to launch into a technical discussion which undoubtedly would sound like double-talk to most of you. It will be much simpler and certainly more effective to refer to a statement by Mr. Robert DeLuccia, Chief of the Bureau of Power of the Federal Power Commission, who is intimately familiar with the problem and well qualified as an engineer to give an expert opinion. Last August at a meeting in Boston, Mr. DeLuccia stated that not more than 25 per cent of the total capacity used to supply the power requirements of this area should be in the form of hydro power and that the other 75 per cent must be steam power to maintain a dependable, balanced supply.

Ten-Year Estimate

In analyzing electric power requirements and the possibilities of developing additional hydroelectric power, it is customary to separate Maine from the other New England states because of the Fernald Law which prohibits the export of water power from Maine. In a report issued last August by the Federal Power Commission covering a study of the market for electric power in all of New England except Maine, it is estimated that there will be 1,832,000 kw of new power plant capacity needed to supply the increasing usage of electricity during the next ten years. This will result in a total capacity of 4,930,000 kw in 1960 of which 25 per cent or 1,230,000 kw can be hydro power. Deducting the amount of hydro capacity already installed in the area amounting to 618,000 kw leaves 612,000 kw of hydro power which can be developed without upsetting the proper balance between steam and hydro power. Assuming that this much hydro power can be found which can be developed on an economically feasible basis, we will end up in 1960 with 12.4 per cent of our total electric power capacity in the form of new hydroelectric power installed between 1950 and 1960.

Now let us assume for a minute that all of the new water power capacity is installed by the federal government. Since the government has only to worry about collecting taxes instead of paying them, and since the annual cost of money to the government is substantially below that which private industry must pay to attract investors, we will say for the sake of argument that the apparent cost of this water power might be only half of what it would be if it were developed by the privately owned utility companies. Due to the small percentage of the total which this assumed federally-developed water power represents, the net effect on the overall cost picture, using these assumptions, would be a reduction of approximately 5 per cent. Even this small percentage represents an imposing amount when stated in dollars. The important question, however, is: Will such a program of federal water power development fulfill the claims made for it by the government's economic planners, or are these claims only politically attractive scenery for their real objective? That objective is the nationalization of the entire power industry as the first major step in their conception of Utopia—a complete planned economy—with federal ownership and operation of all means of production.

Obviously, I cannot claim that what I have referred to as the real objective of the federal power program is an estab-

lished fact. It must, therefore, be considered as a simple assertion which I emphatically believe to be true but with which many people do not agree. There is encouraging evidence, however, that more and more of our thinking citizens are coming to recognize the pattern being followed by a comparatively small but powerful group of men in the administrative branch of our federal government. Such outstanding men as Byrnes, Baruch and Byrd, along with many others, are becoming increasingly critical of these policies and fear the advent of the socialistic state by indirection or through the back door, so to speak.

Effect on Industrial Economy

Going back to the question of whether a federal power development program for New England will have a significant effect on our overall industrial economy, it is necessary to analyze the relationship which power costs bear to the total cost of manufactured goods. This percentage will vary somewhat for different industries, but the average is less than 2 per cent. As I pointed out previously, complete federal development of water power during the next ten years could conceivably reduce overall power costs by only about 5 per cent even using the government's method of figuring. Applying this reduction to the cost of manufactured products, it is equivalent to about ¼ of a cent per man-hour of labor cost. Let's see what this means in a few specific instances.

1. The total cost of power for manufacturing a pair of shoes is about 5 cents. A reduction in power cost of 5 per cent means a saving in manufacturing cost of ¼ cent a pair.
2. The total cost of power for manufacturing the woolen cloth for a man's suit is about 40 cents. A reduction in power cost of 5 per cent means a saving in manufacturing cost of 2 cents per suit.
3. The total cost of power for manufacturing a typewriter is about 40 cents. A reduction in power cost of 5 per cent means a saving of 2 cents per typewriter.

I think that the few examples I have cited, which are representative of most New England industry, are enough to indicate very clearly that a federal water power development program cannot possibly have any material bearing on the economic health of our manufacturers. It is an intriguing idea politically, but it is a cruel trick to play on organized labor which is supporting it quite generally in the hope that it will mean a more profitable industrial economy and, therefore, steadier jobs and better pay and working conditions.

The fact that the possible benefits of so-called low cost federal power have been, and undoubtedly will continue to be, very much overrated does not in any sense mean that there are no other possibilities of improving the competitive situation of New England's industries.

Plant Modernization

You are familiar with the attempts being made to start a steel mill here in Connecticut. If that is successful, it will be a big help to steel users in this area. That's looking into the future, but right now—today—there are many opportunities for substantially lowering costs of manufacturing here in New England provided management is willing to adopt a bold attitude and will proceed with a major program of modernization of both machinery and buildings. There have been a number of private investigations made of industrial conditions in other parts of the country and, in almost every case, one of the greatest advantages disclosed has been that the buildings were modern and designed for the most efficient operation. We have an example right here in Connecticut of a manufacturer who moved into one of the new plants built during the war but closed down afterwards. This manufacturer had formerly been located in a typical multi-story, old-fashioned mill in another part of New England. After more than a year's experience in the new location the management has reported a saving of 25 per cent in operating costs.

In some sections of the country effective work has been done through the formation of privately financed community industrial development organizations which assist in providing new modern factory buildings. So far this idea has been used in only a few locations in New England, but it is receiving more and more attention. The Connecticut Light and Power Company, for instance, is undertaking to promote such a plan in the various communities in which we operate.

Utility Company Needs Prosperous Community

In this connection, it is appropriate to point out the importance of a prosperous community to the financial well-being of the utility company serving the area. When a manufacturer's business begins to be unprofitable, he has the option of liquidating or moving to another part of the country where conditions are more favorable. Neither of these options are available to the utility. Once the investment is made in power plants, transmission lines, substations and the other facilities necessary to supply service, which is inherently very large, the economic health of the utility company is very largely dependent upon the general business conditions of its service area. In a prosperous community, manufacturers buy more of the utility's service and steady employment and good wages mean that householders and merchants will also buy more; all of which means it is in the utility's own selfish interest to promote sound business development.

For example, we maintain a staff of industrial power engineers whose principal function is to help our customers operate more profitably. They have been trained in production methods analysis, materials handling, and other techniques which may be of considerable value, particularly to the smaller manufacturer who does not have production experts on his own payroll.

Electricity and Agriculture

Similarly, in the field of agriculture, we have a group of men specially trained in agricultural engineering to help show our farmers how to make greater profits through increased use of electric service. Connecticut can be proud of its accomplishment in being the first state in the union to have electric service available to all of its farms. This has been accomplished without the use of federal funds, through the close cooperation of the Public Utilities Commission, the University of Connecticut, and the various farm organizations.

The disturbing thing about the question of federal development of New England's water power is that the idea is being advanced as the cure-all for our real or imagined economic ills. As I have pointed out, complete federal development of all future hydro power that can be effectively used during the next ten years can hope to have only an inconsequential effect on the overall power costs. In addition, the entire cost of electric power in manufacturing represents, on the average, only about 2 per cent of total manufacturing costs. In the face of these facts, it could be disastrous to rely on such a program to

attain our objective. We would be better advised to devote our time and talent to other phases of the problem which offer much better possibilities of producing significant results.

Leland Olds, Girard Davidson and the rest of the government ownership crowd are not, of course, going to accept the views of the New England situation which I have outlined. To do so would kill all chance of their extending federal ownership and control of power to this area and ultimately to the entire nation. You will undoubtedly hear them bemoaning the fact that high power costs make it impossible for New England to have an aluminum plant. That is absolutely true, but there isn't a thing the government can do about it that will change the picture.. The manufacture of aluminum calls for large amounts of electric power which is used almost continuously 24 hours a day and which must be available at a cost of about 3 mills per kilowatthour. There just isn't any, and there never can be any of that kind of power available in New England from either steam or hydro plants, even with federal subsidies. In fact, there are very few places in the United States where such power cost is possible.

Water Resources Studied

At the present time there is a proposal before Congress providing for a study o the water resources of New York an New England. The utility industry i ready and willing to cooperate in such study, because it recognizes that there are many problems involved in th overall question of water resources. I hope, however, that the proposed committee is not merely another device t sell New England a bill of goods in th form of federal ownership and control o its power supply. Certainly the people of New England would have more confidence in the findings of such a study i the committee were more representative of New England as provided in Senato Lodge's bill last year.

Simplified Financial Reports to SEC May Save $500,000 Annually

MEMBERS of the Committee on Public Utility Reports to the Securities and Exchange Commission, of the Advisory Council on Federal Reports, have estimated that the recent revisions in S.E.C. Forms 10, (original registration of securities under the Securities Act of 1934), 10-K (annual report form for all registrants), and 8-K (current monthly report form for registrants) will substantially reduce the cost of preparing these reports. Most of the savings will be due to changes in Form 10-K which a careful estimate shows will require approximately 120,000 man-hours less to prepare than would have been needed if the old form used in 1949 were now in use by all registrants. Translated into dollars at average pay for the quality of work necessary to prepare such reports, and including printing and other expenses, it is believed that the revisions will produce a saving of half a million dollars yearly.

While the biggest reduction in costs will undoubtedly be realized as a result of the changes in Form 10-K, there will also be some reduction in the cost of preparing the other report forms mentioned above. Changes in Form U-5-S (annual report of public utility holding companies under the Holding Company Act of 1935) will also lessen somewhat the work of preparing this form; and the Director of the Securities and Exchange Commission's Public Utility Division, Morton E. Yohalem, in a letter to David E. Cohn of the Bureau of the Budget, has agreed that there is " . . . necessity of comprehensive review of the various report forms under the Holding Company Act," but that further time and study will be required for additional revisions.

The Committee on Public Utility Reports of the Advisory Council on Federal Reports has cooperated with the Bureau of the Budget in securing these savings to the electric and gas industries through simplification of S.E.C. report forms.

The Advisory Council on Federal Reports is appointed chiefly by certain business organizations at the request of the Director of the Bureau of the Budget—"To advise with the Bureau in simplifying and improving questionnaires and reporting procedures of the federal agencies." The business organizations which appoint the members of the Council are at present:

- American Chamber of Commerce Executives
- American Retail Federation
- American Trade Association Executives
- Chamber of Commerce of the United States
- Controllers Institute of America
- National Association of Manufacturers
- National Industrial Council

The Council maintains a principa office in Washington at 1615 H Street N. W., Washington 6, D. C.

The federal agencies cover a wide field and the questionnaires and reports called for from all sections of industry and commerce are so numerous and varied that they cannot readily be cata logued. It is obvious that without some coordinating authority there would be an immense amount of duplication of information requested; and often requests are made for information that is of little or no value, at least in proportion to the effort necessary to assemble it. The coordinating authority to keep reports and questionnaires within a practical minimum, to prevent duplication, and to make requests for information as clear and simple as possible, is one of the statutory functions of the Director of the Bureau of the Budget. The Advisory Council has been created at his request to assist him in performing this function.

The Advisory Council works largely through committees which it appoints to represent various segments of industry and particular groups of reports. In June, 1949, such a committee was appointed by the Council to deal with reports rendered to the S.E.C. by electric and gas utilities. Its scope was stated in the letters of appointment in the following words:

"To advise the Bureau of the Budget concerning reports requested of the public utilities industry by the Securities and Exchange Commission, including pertinent regulations, and to assist in the im-

(*Continued on page* 89)

Public Utility Advertising Pays Off

By H. Obermeyer
Vice President, Bozell and Jacobs, Inc.

An address presented before the Public Utilities Advertising Association, Region No. 1, Boston, Mass., February 16, 1950

HOW can we make public utility advertising justify itself in the eyes of management, of stockholders, and the public at large? What does advertising really accomplish for an electric or gas company that it couldn't do without? Why does a regulated monopoly have to advertise at all?

Those questions are asked—and not always by outsiders alone. They are asked at board meetings and executive conferences and even at sessions of labor-management committees. We've all had to answer them at one time or another.

But there is only one place you'll find an answer that's worth anything; and that, you won't be surprised to hear, lies in the advertising itself. What kind of advertising are you doing? What are you doing it for? What results are you getting, and how do you know you're getting them? That's the sort of question you can ask—and answer—yourself. And the kind of answer you get will determine whether you and your advertising are essential elements in the successful operation of your company—or whether, for reasons still to be disclosed, they are just being tolerated.

Advertising Is Competitive

The thing to remember is that your advertising is always competitive—with other advertising, that is—whether your business is competitive or not.

Industries like ours, whose advertising is so preponderantly institutional, must, I always think, be particularly guarded in this respect. The temptation is generally to write for "the front office"—which, of course, is not peculiar to the utility advertising man—but this need not and should not preclude a sincere and honest determination to produce results—to attain the maximum number of favorable responses from a given expenditure by making use of every device, method and technique that is *known* to produce such results.

I have a class at City College in New York where we try to teach the principles of advertising management quite apart from teaching the skills of so-called creative advertising. The most difficult thing, as well as the most important in our estimation, is to convince students who have studied copy-writing and lay-out and all the mechanics of getting a piece of advertising into print what it means to be responsible completely for the wise and effective expenditure of the advertiser's dollar. Pride of authorship gets in the way almost constantly. Surface attractions based on alleged inspiration take the place of fundamental appeals that require digging and thought. Advertising becomes an end in itself rather than an agent or channel of communication, or a link in the chain of distribution that must continually justify its right to exist.

Advertising and Top Management

The same thing happens in the business world as in the classroom. And it is not always the advertising manager who is to blame. Part of the blame at least belongs to top management with its—often unalterable—conception of advertising as a "fixed expense" in terms of percentages of gross revenue, or customers or sales quotas, or industry averages, or what have you, rather than as the cost of doing a specific job with the most effective tools available for the purpose.

For this reason, in places where the true function of advertising is somewhat better understood, the task method of budgeting appropriations is gradually coming to the fore. This consists of defining the minimum task to be accomplished by means of the advertising program, and then making a skillful decision as to the selection of media, size of space, and frequency of insertion necessary to accomplish the given task.

Executives who look on advertising as a more or less routine expenditure often miss the chance of obtaining its greatest benefits. They expect no tangible results, because they have never thought of a way to measure them, nor would they generally know what to do with them if they had. Such advertising is created in a vacuum without implementation or coordination with the company's other operations and aims. It reveals itself by left-handed compliments like: "That was a good-looking ad we had in the paper last night;" or worse, "We ought to publish that one in the annual report."

But the advertising manager who really wants to make his job pay off needn't succumb to the implications of this point of view. All he needs to do in most cases is to sharpen his objectives.

Henry Link of the Psychological Corporation, who has made a life study of the factors in advertising that influence public opinion and help people to understand what you are driving at, has this to say:

"One might almost formulate a basic law for projecting ideas, somewhat as follows: The effectiveness with which an idea is projected depends on the sharpness and simplicity with which it is defined before being put in the form of a message."

What Do You Want Remembered?

He recommends as a regular exercise putting into question form the specific facts you would like people to remember after reading your copy. It's a wonderful idea. How many advertisements that you see in the newspapers and magazines, other than those offering specific merchandise for sale, make clear the exact purpose for which they were prepared? How many seek to accomplish any purpose at all?

I won't mention the name of the advertiser, but the last time I was in Dr. Link's office, not much more than a month ago, he showed me a piece of copy that had recently been tested in personal interviews with readers of average mentality to determine, among other things, their comprehension of the facts

stated in this particular ad. The majority came away from their reading with exactly the opposite conclusion that the copy writer had tried to convey. This is an extreme case, although the advertisement in question was one of a large and important organization. A little thought in defining objectives before starting to write would, I am sure, have cleared the air for the writer and for the reader as well.

Call Your Shots

So call your shots when you aim. If you want to sell appliances, sell for all you are worth. Write selling copy and write it with a punch. I have seen so-called merchandising utility ads that contained literally no information whatever that would enable a prospect to tell where or how or for what reasons the product in question was offered for sale. In many cases there is nothing to indicate that the advertiser is willing to part with his goods at any price: just a line or two in small type that suggests seeing some appliance or other "now on display at your local dealer's store or at any company showroom." If that is the best your sales department will let you do, you had better confine yourself to institutional advertising or take a sabbatical until conditions improve.

I'm going to talk some more about sales promotion in just a moment. But this matter of defining objectives applies just as much to load building—which certainly needs a selling approach, too—or to any one of the several ways by which advertising can be used to gain public favor or understanding.

Dr. Link was good enough to allow me to quote the principles formulated by his organization as a result of five years' continuous experiments in what he calls the techniques of communicating ideas, a study sponsored by ten of the leading advertisers in the country. I commend them to you prayerfully. To begin with:

1. Most *advertisements* cover too much ground and try to get over too many ideas at once. (Although some improvement has been noted, Dr. Link says that advertisers still seem to be governed by how much they have to say rather than by how much the public will read or grasp.)
2. Most *campaigns* cover entirely too much ground. Each ad in a campaign is often on an entirely different subject.
3. Most campaigns lack a central *theme* or slogan which will serve as a psychological hook on which to hang a series of impressisons.
4. Most ads lack emotional *impact* and are entirely too factual, pedantic or preachy.

And then these three basic principles which you can paste in your hat:

A. The effectiveness of a message or advertisement depends on the extent to which it identifies itself with the interests of the people for whom it is intended.

B. Unless the message or ad is properly tested, there can be no assurance that it has identified itself with the interests of the intended audience.

C. Of all the ideas which fail to interest and impress people, figures and statistics are probably foremost.

Identification with Reader's Interest

The first of these—identification with the interest of the reader—will, I imagine, be accepted by everyone in theory. But it is amazing how often it is overlooked in the desire to impress the writer's own point of view.

Testing a particular ad for interest or understanding does not always require an elaborate or expensive mechanism; nor (though I'm not sure Dr. Link would like me to say this) the employment of an expert in the field of testing techniques. It's really quite simple. Just show your copy—in a complete proof, if possible—to half a dozen people of ordinary intelligence: the elevator operator, the postman, the fellow sitting next to you on the train, your secretary who tells you when you've got a smudge on your face, by all means your wife, and, if you know him, the president of your bank.

Reader Reaction

Ask them to tell you what they think of it—not that it matters particularly, but, by watching closely and noting the time and attention devoted to examination of your ad, you can gauge pretty well how successful you have been in arousing their interest. People invariably dwell on things that capture their fancy, even though they may have already gotten your point at a glance.

Then ask them to state in a few words the principal fact or idea they ha gained from reading your message. they have missed it or misconstrued don't try to explain. Just go back a do it over and be glad you took th precaution before spending any more the company's money.

Testing Overall Effectiveness

Testing individual advertisemen shouldn't, however, be confused wi testing the overall effectiveness of yo advertising in connection with all oth informational activities. Frankly, don't see how it is possible for a co pany to conduct its public relations i telligently without a fairly consta guide; measuring the variations in pu lic opinion between the sexes and amo economic groups; and comparing th results at reasonable intervals not on to get a picture of the trend, but al to determine at once the success of yo past efforts and the leaks in the di where extra effort and attention shou be given. This requires objective ha dling by trained personnel. It is no j for the amateur.

Dr. Link's third principle regardi the lack of interest in figures and st tistics must be accepted with one rese vation. There are two extremes in cop writing, both of them bad. One confin itself to general statements and unsu ported claims—which, as Hitler taug the world, may be effective if you s them often and loudly enough—b which in the situations that confro most of us leave much to be desire The other extreme in which every e pression is detailed by factual referen is undoubtedly the one Dr. Link h in mind. The compromise I would su gest is to select one basic fact that go to the heart of the matter and bui your case around that.

Most advertisements, it's worth r peating (like most speeches), try to g over too many ideas at once.

But let me get back to the subject objectives—first, the need for a clea cut objective in planning effective a vertising of any kind; and then tho particular objectives that, it seems t me, are indicated both by stated polici and by the fundamental requirement of the electric and gas service industri at the present time.

Without an objective there can b no planned result; as Aesop Glim re marked in his Printers' Ink "Clinic several weeks ago, we need to be re minded sometimes that advertisin

money is usually appropriated to buy some results. And so, he adds, "our job is not completed unless we have told our prospect—clearly, explicitly and fully—what we want him to do *after he has read our advertisement.* . . . There are no words more important than the last six."

Two Important Utility Jobs

There are two outstandingly important jobs ahead of the public utility industries in this year of 1950—jobs that *must* be done if these industries are to survive—and both of them jobs that demand the most devoted and skillful services of the trained public relations and advertising man.

One is a straight out-and-out selling job, to sell the cubic feet and the kilowatthours created by the new plants and transmission lines for electrical energy as the result of the postwar expansion program, and by the Bunyan-like construction of natural gas distribution systems that virtually span a continent.

The other is the job of making all our people—customers, employees and stockholders alike—aware of the implications and dangers, not merely to our industry, but to our entire economy—of the galloping threat of socialization that hasn't even the decency to march under its true colors.

More than one utility executive has told his advertising man that this is his number one job; that the best way to assure his advancement and increase the prestige of his department is to apply himself and his talents to what a leading insurance company president has called "another war of independence."

Those whose companies are supporting the Public Information Program which Bozell & Jacobs is helping to carry on for a growing number of electric utilities are receiving a constant flow of ammunition for local targets in the way of advertising, press releases, bill inserts, speeches, and conference matter. This program, which has just completed its first year, is now well underway and tangible results are beginning to appear in most areas. Many of the industry's public relations and advertising managers depend on it increasingly for the raw material that they shape into local messages through various media and channels of communication. For the local story is given point and body when it is seen as part of the national struggle to preserve the freedom of all individuals, professions and occupations against the enveloping forces of Big Government.

But whether we are selling power load, or creating public understanding, these are projects that require a broad horizon—broader, perhaps, than the industry has been accustomed to for some years. After all, with the break-up of the holding companies it was only natural that management planning and thinking should revert to a more restricted viewpoint. Then, during the war and for some years after it, all selling and load building took a back seat to the point where, in many cases, sales and advertising departments were practically liquidated or their personnel assigned to other divisional groups.

The result—now that the industry finds itself faced with major problems whose only hope of solution is a large-scale effort to influence public opinion and win public acceptance—is that the companies must really gird themselves for action on a heroic scale if they hope to regain the ground which they have lost, let alone make measurable progress toward their ultimate aims.

A Matter of Dollars and Cents

It is largely a matter of dollars and cents, putting it bluntly. Awhile back I spoke of the modern trend in favor of the task method of budgeting advertising appropriations as opposed to the traditional method of using fixed percentages, which is still practised in most utility companies. The advantage of the task method is that it helps to keep pace with the real costs of accomplishing a given purpose, including all factors such as: higher space rates, more expensive production, the influence of new media, the extent of other forms of promotion and publicity competing for public attention, and so on over a long list.

That the utility industry has not done this is evident when we compare its expenditures for sales and advertising with those in other lines. We have learned to expect that this would be low in comparison with durable goods reflecting considered purchases or consumer items of the impulse-buying type. It is somewhat startling, however, when we see it in relation to another service, such as: transportation, which, despite many differences, also has some of the same problems that confront the gas and electric business.

Sales Management published a table in its issue of December 15, 1949, based on a study of 264 companies, which showed the combined selling and advertising expense of the utilities at 1.317 per cent of gross sales, compared with 16.44 for the transportation industry, a difference of more than twelve to one. Selling expense is a big factor, of course, in transportation where every unit more or less involves a separate transaction. Nevertheless, the difference in advertising per se is also considerable—0.613 per cent for utilities, and 2.190 per cent for transportation, or about three and one-half to one. This jibes closely with the results of the P.U.A.A. survey last year, covering 180 gas and electric companies, in which it was found that the ratio of utility advertising expenditures to gross revenue was on the order of 0.60 per cent. This varies only slightly from pre-war figures, indicating that the utility industry as a whole is failing to keep up with the rest of the procession, let alone with its own growing need for an adequate pipe-line of communications.

Edwin Vennard, vice president of the Middle West Service Company, who has gone over much the same ground, suggests using per cent return on total investment as a measure of a properly designed promotion program, rather than one based on gross sales, or operating revenue, or even net. However, since the rate of return depends partly on the load factor, partly on the rates that can be charged for gas and electricity, this may well be regarded as an *objective* of the sales-advertising program rather than as a method of arriving at a proper figure for budgeting purposes. The cost of doing the job must be established within reasonable limits before it can be determined whether it is worth the price.

Individual Promotion Programs

It is encouraging, nevertheless, to find individual companies planning large-scale promotional programs for the first time since the war. A recent issue of *Electrical World* published two feature news articles, one entitled "Union Electric Company Steams Up for Accelerated Selling in 1950;" the other "Back in Action in Sales Promotion," referring to a "double-barreled" campaign of the Central Arizona Light & Power Company inaugurated after eight

years of "defensive" selling. Both of these campaigns involve extensive use of advertising in every available medium and are probably a forerunner of what will be taking place in the company of everyone represented at this meeting, if it has not already happened, before many more months have passed.

Such campaigns can have a highly beneficial effect on your public relations, too, because people always respond favorably to those who solicit their business by offering them better value for their money. By conducting these campaigns, the utilities also remove from themselves some of the stigma of monopoly by acquiring the characteristics of a competitive industry.

But informative institutional advertising is needed as well, and it would be unfortunate if the pendulum were to swing altogether into the area of sales promotion, merchandising and load building to the exclusion of other, and equally pressing, requirements. For instance, have you told the story of your expansion program so that even the school children can tell it back to you? Certainly this is vital while the Government makes capital of alleged power shortages. Have you told the story of soaring operating costs in relation to slight rate adjustments, after years of holding your part of the household budget line virtually alone? This has added significance when the Government is offering utility services below cost at the taxpayer's expense. Are you telling your customers and employees what it will mean to them unless the tide of socialization is turned back before today's billions of dollars in the Federal debt approach the trillion mark?

Telling of Aims and Policies

For that matter, are you telling the story of your own company's aims and policies in regular advertising space or on the air? Some of your bosses may think this sort of thing has little tangible value. Beware of their genial tolerance, which is more dangerous than outright opposition. Tell them what Carl Byoir, public relations consultant for the great A. & P. Co., told me just the other day.

Some years ago, he said, the A. & P. made a series of tests on institutional advertising in comparison with straight merchandising and price copy. These ads had nothing to do with any anti-trust litigation, as they have today, but dealt with the simple question of what kind of an institution A. & P. is.

Three groups of five cities each were selected. In the first group, normal merchandising copy was continued every week. In the second group, merchandising and institutional ads were alternated in the same size copy; and in the third group institutional copy in the same size space was run every week.

Comparative sales checks were made weekly and for 13 weeks there was no indication of any sales advantage traceable to the different types of advertising. However, beginning with the fourteenth week, charts began to show that the cities with alternating copy were running slightly ahead of the cities where the straight merchandising copy was running, and that the group of cities where institutional only was being used was doing better than either of the other groups.

In 1939 the A. & P. prepared an institutional ad entitled "A Statement of Public Policy," which it was proposed to run in all of the newspapers regularly used by the A. & P.

Before scheduling this advertisement nationally, the company tested it in 14 test cities and found that in 12 of the 14 cities the sales showed a definite increase over the average sales in all other cities where the regular merchandising copy ran.

Such results may not be conclusive; but they are definitely encouraging to those who like to believe that advertising can sell ideas as well as merchandise. They give substance to the conviction that goods and services are successfully promoted to the degree that the public becomes familiar with and favorable to the company that produces them.

That then, may be set down as a general aim for all utility advertising. But it does not release us from the necessity of defining a specific objective for each distinct piece of advertising copy. That is the one thought which I hope you will take away from this meeting. It is well summed up in a comment by Dr. Claude Robinson whose Opinion Research Corporation made a study of public relations advertising back in 1947. What he said then is still, I think, a valid criticism of some types of public utility advertising. It was this:

"Conclusions need to be spelled out, made explicit, not left to inference. When it remains for readers to decide what an ad is driving at, they often either arrive at no conclusion or misinterpret the advertiser's message altogether."

Today, when your business is under the urgency of a twin drive to stem the advance of a power-hungry bureaucracy and at the same time expand its services to new and higher levels of usefulness in the homes and industries of the country, you cannot afford to leave any reader in doubt as to what you are trying to tell him or why you are telling it.

Vincent Sheean in his "Lead, Kindly Light" quotes the Irish poet, W. B. Yeats, in a translation from Aristotle.

"To write well," said Aristotle, "express yourself like the common people, but think like a wise man."

If I have any claim to wisdom, I think I can show it best by stopping right there.

Notes on the Coming EEI Convention

(*Continued from page* 66)

tained. Hotel circulars containing application blanks have already been mailed to member companies.

Delegates will be able to commence registration at the Convention on Sunday, June 4, at noon in the Hotel Traymore. Registration headquarters at the Traymore will close at 5 o'clock on Sunday, and will reopen at 9 o'clock on Monday morning. At noon on Monday, the registration office will move to the Convention Hall, where registration will be continued until 5 o'clock in the afternoon. Thereafter, on Tuesday and Wednesday, all registration will be conducted at the Convention Hall, from 9 to 5 on Tuesday, and from 9 to noon on Wednesday. There will be a registration fee of $10.00.

All delegates are urged to register promptly after checking in at their hotels. It is pointed out that *Convention badges and buttons will be absolutely essential for admission to the general sessions of the Convention, to the ladies' luncheon, and to the Tuesday evening party*. These all-important means of identification will be obtainable only at the registration desk.

Markets Are Minds For Industrial Power Salesmen

By Glenn S. Young

Manager of Power and Lighting Sales, Kansas City Power & Light Company

An address before the Power Sales Conference of the Missouri Valley Electric Association, Kansas City, Mo., Feb. 9-10, 1950

A NUMBER of years ago, when the county farm agent and his scientific farming ideas were new, a meeting was scheduled to be held in a small community in Kansas. Moze, an old negro farmer, had been asked by his neighbors to attend the meeting and was promised he would learn something about better farming methods. They didn't have any success in getting him to respond, so the county agent went to see him. After a good deal of persuasion, also without success, he finally said—"Moze, give me just one good reason why you won't come." Old Moze looked up and replied—"Boss, I *noze* more than I *dooz* now."

There is a tremendous amount of "know-how" in the minds of the people who make up the electric industry. "Know-how" that needs to be transferred to the minds of the people who use our products—electric energy and the electric equipment that transforms that energy into industrial progress, convenience and comfort, pride of ownership and profits for the user.

Markets are minds. For ten years—in war and in peace—those minds have been coming to us for the benefits the electric way provides. Coming to us with demands for our product almost beyond our capacity to produce.

Now the picture is changing — the capacity to produce is beginning to exceed the demand by margins *more* comfortable for the production man and *less* comfortable for the salesman.

In short, the salesman now has the ball and, in spite of his years of experience, the ball feels a little strange. We need some practice sessions and some new plays geared to the changed conditions.

Industry's Job

Mr. Harold G. Moulton, President of Brookings Institution, in the January 11, 1950, issue of *Pathfinder,* believes that if America is to continue to expand and increase its living standard then industry should:

1. Strive continually to increase output, step up its rate of mechanization, scrap old plants and build new ones equipped with better machines.
2. Drive harder and continuously for internal management economies.
3. Continue policies that will increase the buying power of the masses. The best means of accomplishing this is to lower prices. It gives a direct stimulus to demand for products made in factories where efficiency has been increased, and it promotes more employment.

He also gives some excellent advise to labor and government stressing that these suggestions are contingent upon the right kind of economic and governmental policies.

Effects of Changed Conditions

These changed conditions present some knotty problems to the minds of our customers. High production costs have narrowed the profit margin—production workers are more conscious of improved working conditions and are more insistent in their efforts to obtain them—improved products are necessary to maintain competitive positions.

How do we, as sales representatives of the electric industry, fit into this picture? What "know-how" do we have that will benefit our customer and create additional business for us?

We "know-how" our customer can use our product to provide production workers with better seeing conditions. Better seeing results in less fatigue for the worker—less wasted time and material—improved employee morale—all of which expand the profit margin.

We "know-how" to apply electric heat to practically any heating process used by industry—and that represents a tremendous market. All manufactured products, with very few exceptions, require heat energy in their processing. Heat in the form of electric energy is the most flexible. Consequently, it is the most desirable for the majority of applications—and this is very important to us. Granting its higher heat-unit cost, there are a number of factors that, when evaluated in terms of benefits, make it even cheaper than other forms of heat.

I repeat that there is a wealth of individual and collective "know-how" in the electric industry but until it is transferred to the minds of our customers and they combine it with their own ingenuity and *put it to work* for them—nothing happens.

How can we best organize our forces to get into the minds of our customers the benefits the industry has to offer?

It is primarily a "grass roots" job of using the tools or sales aids we have in getting the story to our customers.

The key man is the power salesman. He is on the firing line. His first duty is to merit and retain the confidence of his customer. When he has done this, through regular contacts and services rendered, he has built a foundation of good will toward himself and his company that is invaluable in retaining existing business and creating new business.

His next important duty is to learn as much as he can about the customer's operation both as to its relation to electric service requirements and to the economics of the operation as well. Such knowledge enables him to talk the *customers' language*—a most important part of sales work.

Equipped with the confidence of his customer and a working knowledge of his customers' operations, the power salesman is in the quarterback position in this game of industrial progress through electrification. Playing on his team are the electrical equipment manufacturers, jobbers, dealers, contractors, consulting engineers, trade associations, trade journals—in brief all the electric industry.

Watching the Quarterback

Let's take our seats on the fifty-yard line and watch the quarterback at work. The field is a metal working plant—general lighting levels of 5 to 10 footcandles, a few bare oil splattered lamps hung over some machines for local lighting—dark ceilings, dark sidewalls, dark machines, absorbing and therefore wasting a large part of the available illumi-

nation—a fuel-fired batch-type enameling oven located in one corner of the plant so the excess heat won't be dissipated in the general working area (the quarterback makes a mental note of the unnecessary handling of materials to and from the oven)—A battery of individual welding machines each performing an identical welding operation ("A good bet for a production line automatic welding job here" silently says the quarterback)—A few small fuel-fired heating applications are noted —babbitt pots—compound pots—("Not much attention given to temperature control" notes the quarterback)—looks like a big field and a long way to the goal line. But some well planned line plays should gain a few yards and the customer benefits are enough to hold the gains.

The First Play

So the first play is a well planned lighting layout in accordance with Illuminating Engineering Society standards with suggestions and specifications for painting the ceilings and sidewalls. The paint manufacturer is consulted for suggestions for machine painting—the fixture manufacturer through his jobber and dealer is called in to bid on the job, as is the wiring contractor. All very well, but the customer 'stiffens his line' with the price obstacles—so the quarterback counters with showing the customer some successful installations in his territory—before and after pictures —motion pictures depicting the benefits of adequate lighting—perhaps a demonstration installation in the customer's plant.

Additional plays for the heating, welding and materials handling loads are not being overlooked—the quarterback makes sure that key plant personnel is on the mailing list for *Electrified Industry*, a pictorial presentation of electricity at work, for General Electric's "Electric Heat in Industry" and Edwin L. Weigand Company's "Chromalox News." When an application story appears in one of these publications that applies to a specific job in the customer's plant it is called to his attention by a personal follow-up call.

And during this follow-up call the quarterback calls the signals for the equipment manufacturer to make some good gains. He creates interest in the customer's mind for seeing and hearing General Electric's "More Power to America" sales stimulating programs on the "Infrared Lamp" (for that enamel baking job) "Materials Handling" (for stimulating ideas about conveyors for getting the material to and from the infrared oven on a production line basis —and also production line planning for that potential automatic welding process). Then there are the programs on "Welding" and "Industrial Power Distribution" that tie in and present an overall story of industrial progress through cost-cutting electrification and mechanization.

The goal line isn't reached in a day, or a month, or a year, but yardage can be gained with each well planned installation. Group meetings consisting of a number of customers, the equipment manufacturers' representatives and electrical contractors can be arranged and perhaps be conducted by a specialist in the particular application.

Follow-up Sales Activity

Such meetings will reveal a number of interested prospects for hard-hitting follow-up sales activity. The Westinghouse Productive Power Show is a sales stimulating stage presentation depicting the modern factory and demonstrating by actual operation the efficient use of lighting, adequate and efficient wiring methods, power and heating applications.

There is another important ally that the power salesman should make a member of his team. He is the customer's production man. Each of you can recall incidents where an improved lighting installation in a small area was the forerunner of improved lighting throughout an entire plant, or where an installation of a few watts in electric heating equipment grew into an important heating load—all because some production man learned from actual experience the benefits delivered by our products.

Creative Selling

Moreover, when you plant an idea or a suggestion in a customer's mind in such a way that he can develop it and make it a part of his own accomplishment— a master job of creative selling has been done. Such jobs have a habit of sticking and growing because they represent pride of accomplishment and are not permitted to fail.

Markets are minds—and it is the power salesman's job to transmit to those minds the ideas developed by the electrical industry — ideas that contribute to sound industrial progress. By so doing the private business managed utility distinguishes itself from the publicly owned system and the money invested in sales promotion is a sound long-term investment paying dividends in good customer relations and profitable business for the entire electrical industry.

Gentlemen, 'together we noze it'—together 'let's dooz it!'

Research Program Aimed at Extending Railway Electrification is Started

FOUR major industrial groups have started a jointly-financed cooperative research and development program aimed at much greater application of railroad electrification. The groups include railroads, electric equipment manufacturers, coal interests, and the electric light and power industry.

The administrative sponsor of the program is the Edison Electric Institute, and supervision will be conducted by the recently appointed Joint Committee on Railroad Electrification.

The first phase of the research program is a technical and economic investigation to be made by the Battelle Memorial Institute of Columbus, Ohio. The areas of research are the problems of power supply, including overhead lines and substations, locomotives, signal systems and electric control.

The results of this technical and economic study will then determine the practicability of a full-scale research and development program to provide improved methods, facilities and equipment necessary for much greater railroad electrification.

The Committee, representing the sponsor and supervisors, which will work directly with Battelle Memorial Institute, consists of F. McQuillin, West Penn Power Co., Pittsburgh, Chairman; J. C. Fox, Virginian Railway Co., Norfolk; J. Stair, Jr., Pennsylvania Railroad Co., Philadelphia; T. F. Perkinson, General Electric Co., Schenectady; Charles Kerr, Jr., Westinghouse Electric Corp., East Pittsburgh; L. W. Birch, Ohio Brass Co., Mansfield; and E. C. Payne, Pittsburgh Consolidation Coal Co., Pittsburgh.

Safety Considerations in the Design and Operation of Transmission and Distribution Systems

By W. T. Rogers

Safety Consultant, Ebasco Services Incorporated

A paper presented before the Transmission and Distribution Committee, EEI, Detroit, Mich., February 21, 1950

TODAY there are indications of a growing recognition on the part of engineers of the importance of safety. Transmission and distribution engineers have a great responsibility in this whole accident prevention picture, because approximately 85 per cent of all the fatal accidents in the electric utility industry occur on transmission and distribution work.

Approximately 150 fatalities are reported every year to the Edison Electric Institute. This means that some 125 men lose their lives on transmission and distribution work. This means 125 highly trained skilled workmen, 125 fathers who do not come home, 125 of our very best citizens. Besides these fatalities there are some 6,000 lost-time accidents each year in this industry. This is why your consideration of accident prevention is so important.

Responsibility for Safety

We, in the Accident Prevention Committee, are very happy to know that you have a special group in your committee concerned with the safe design, construction and operation of transmission and distribution facilities. For, just as in your own company, you cannot turn the safety responsibility over to your Safety Department and forget about it, just so you cannot turn your safety problems over to the Accident Prevention Committee and forget about them. They are your problems. The Accident Prevention Committee has always endeavored to bring out the facts, to point up the problems and to give suggestions and every aid possible, but it is up to each particular group to really make safety a part of their general effort if we are to make any progress in reducing accidents in the industry.

The background regarding the accident situation in the electric utility industry in recent years shows a seeming lack of progress in reducing accidents. As a matter of fact, in 1947 a 15-year high was reached in lost-time accident experience. You will note, if you read the curves of frequency and severity compiled by the Institute, the remarkable progress made from 1923 down to 1935. Subsequently almost no progress was made for a period of about 10 years, and then the curves started to go up. However, during '48 and '49 they have turned slightly downward and I hope that we will be able to make continued progress on the down grade.

Factors Influencing the Accident Trend

Several factors have had a great deal to do with the looks of the curves. In the first place, we are now doing more work on hot lines. In other words, it is becoming increasingly impossible and impracticable to de-energize equipment to work on it; second, we have been going to higher distribution voltages and have many more lines of high transmission voltages; third, accident reporting has become better and more accidents are reported than were reported formerly; and fourth, due to the increasing benefits paid to employees for time lost above and beyond compensation, in my opinion, there is more time lost than formerly.

Discipline, Morale and Attitude

Also, over the last several years during and immediately after the war, because of the various laws and regulations which it has run up against, supervision in many instances has been hesitant to follow through with its supervisory job as formerly and disciplinary measures have been largely foregone. That is not true in all cases, but I think it has been a big factor. Morale and attitude, together with the hiring of new and green men during and immediately following the war and advancing people to supervisory positions without the years of training which they had formerly, have also had important influence. These are the main factors which have had an adverse effect on the statistics with which we deal.

It is a fact that from 80 to 90 per cent of all accidents are caused by unsafe acts of the individual — that is, the human factor. That means that from 10 to 20 per cent are caused by unsafe conditions.

Now let us look at the human factor for a minute. What is being done to prevent human failure?

First, we are working through our employment procedures to select the right type of individual for the right kind of job so the man will have the proper physical, mental and emotional characteristics to handle the job to which he is assigned. There is a great deal to be done along those lines but I believe that a good start has been made and that increasing attention is being given to the importance of selection methods, particularly as they bear on accident prevention. Then we have our training programs to train people how to do the job properly. To do the job the right way is to do it the safe way and to do it the economical way; for safety to really work it must be made a part of every job operation. In many companies there is so-called vestibule training, where the young people are trained in the techniques of their craft, following which they are continuously trained by the line foreman and supervision.

Supervisory Responsibilities

In addition to proper selection and training, supervision plays a big part in safety work. The foreman must be close to his men, must know their capabilities, their characteristics, their attitudes and besides all that he must know what is on the employee's mind. The supervisor

today is a leader and trainer of men, not as he was years ago, "the bull of the woods."

What about safe working conditions? You may reply that since 80 to 90 per cent of the accidents are caused by unsafe acts of individuals, certainly safe working conditions play a very small part. You will notice, however, that I did not say that we had taken care of the human factor; what I did say is we are working hard at it; for as long as we have human beings to deal with, so long will we have human failure. But by making things as fool-proof as possible we can reduce the possibility of accidents resulting from these human failures.

Fatal Accidents

The inter-relation between human failure and unsafe conditions, is best illustrated in the following accounts of several of the fatal accidents which happened in transmission and distribution work during the last several years:

Occupation—Lineman

Mr. W—— came in contact with a steel crossarm brace which was energized with 2,400 v by a jumper contacting a guy wire, that touched the brace. His left knee was contacting a bare ground wire. The shock caused Mr. W. to fall to the ground. He was revived by artificial respiration and lived two days.

Occupation—Apprentice Lineman

On buck arm near corner pole. Removing rubber line hose and insulator hoods from 4,000-v phases and street light circuit. Shoved insulator hood upward. Hand struck energized phase wire, leg against grounded secondaries. Had been wearing rubber gloves while removing rubber from one side of pole. Took gloves off to climb down pole and go up other side. This made necessary because of secondary running in four directions from pole. Failed to again put gloves on after reaching new working position.

Occupation—Line Foreman

Linemen on pole 2 spans away were placing Nicopress sleeve on 4-kv wire. Tool slipped and contacted energized wire deceased was in contact with.

Occupation—Lineman

Transferring crossarms and raising phases higher on new pole, Mr. S. had removed one phase (6,900 v) and handed it to the man above him. He then started to move insulated platform so that he could reach the other two phases. After getting platform in place he then started to crawl between secondaries and the old crossarm and on to the platform. In doing so, he reached up for what he thought was the double-arm bolt behind the disc insulator for support. Instead his hand touched the dead-end clamp.

Lineman

A lineman was putting in a new line and removing an old line on a 6,900-v rural circuit. He had completed the job and removed his rubber gloves. The helper below the pole was coiling rope when he heard a gasp and looked up. The lineman was hanging from the pole by his strap. His thumb had in some way contacted the top wire which was charged. His side was badly burned at a spot where it touched the ground wire running down the side of the pole. Efforts at resuscitation were unsuccessful.

Lineman

A rural line was being constructed. Certain sections of the existing line were being cut over from 12 kv delta to 7,200-v common neutral. Additional neutral conductor was being strung and pole-type oil circuit breakers were being relocated. The lineman contacted a guy wire with his left hand while apparently in the act of removing the fuse barrel from the cut-out with his right hand. The line was energized.

Linemen

Without orders, a lineman went to assist another already on a pole to install double pole-top insulator pins. He had climbed above the secondaries when in some manner he had a contact with a 13,200-v vertical primary riser wire while his lower left leg was in contact with the grounded secondary.

Mr. X and another lineman were in the process of transferring the lines and equipment to a new pole. Mr. X started to move around to work on another wire and in so doing did not allow himself enough room. He brushed the switch with his shoulder and at the same time had his knee in contact with the secondaries below.

Employee was changing primary insulators from 4-kv pin type to 13-kv pin type on the end of a six-pin single arm at the top of a creosoted pine pole when his body came in contact with the 2.4-kv phase wire and the rounded neutral bracket on the pole.

Employee climbed pole for the purpose of cutting three 4-kv phase wires in the clear. The wires had been burned down and were lying on the ground. Before attempting to cut the conductors the employee allowed his shoulder to contact the neutral wire. The pole upon which he was standing was energized through one of the phase wires contacting a mast arm. When his shoulder contacted the neutral wire he was electrocuted.

A line crew was renewing a 35-ft pole with a new pole having a 4-pin, 8-ft single crossarm with 29-in. pin spacing. A 4,000-v feeder (2 phases and neutral) was being transferred from the old pole to the new pole which had already been set. Employee was removing the wire from road side phase when apparently his chin came in contact with the wire.

A lineman had completed the job of replacing a cracked insulator. He then removed the line hose on each side of him and sent them down the pole. In preparing to unfasten his safety he contacted with his head the conductor on his left while his left foot was in contact with the secondary neutral.

A crew was installing 4th wire to change over 6,900-v, 3-wire to 12,000-v, 4-wire. The line had been built with no insulators in guys. One man climbed dead-end corner pole to bore holes and attach sagging blocks 30 in. below bottom phase. He was just getting into position to hang line when his head contacted the bottom jumper. His hands were on the down guys.

Can you separate the unsafe acts from the unsafe conditions in these cases? Sure the men did the wrong thing! Perhaps it was lack of skill, lack of training or poor supervision or just haste or thoughtlessness. "Being physically present and mentally absent is one of the greatest causes of accidents." Another person put it this way, "You can guard a band saw, but you cannot fence off mental attitudes." The human factor will always loom large in the picture.

After analyzing many accidents like those recited, we believe we know the causes of most of them. We have set up rules and procedures to eliminate them but we still have the accidents. If the men would obey the rules and apply the knowledge we now have, even to the simple matter of making use of the rubber gloves and other protective equipment provided them, we could almost eliminate fatalities completely. As a matter of fact, if the simple rules were followed, it should be safer to work on the pole than to work on the ground. However, we still have men not doing what they are supposed to do—therefore I say we must do our utmost by every means possible to see that slips or lapses will not cause death.

Accidents That Begin on the Drawing Board

This brings me to the "meat" of my talk to you today, which is the safe design and operation of transmission and distribution facilities. First, I would like to point out that a great many of the accidents occur way back on the drawing board in the engineering and design. One of the most important points that is brought out from our analysis of these accidents over the years is that good head room, adequate elbow room, good choice of equipment, clean-cut arrangements and identification of circuits and equipment and an eternal awareness on the part of designers that men must shape their work procedures to things as they find them, will make work easier and safer for the men on the pole tops.

As for suggestions: try to put yourself in the lineman's position and visualize where he has to reach and how he has to work. It would be a good idea if engineers and designers could get out more often to see the actual operating conditions and to try to put themselves in the place of those who have to do the work. If they could sit in on the

investigations of some of these accidents, I believe that it would go a long way to the design of corrective measures.

In building lines, attention must also be paid to the terrain. Sometimes the shortest distance between two points may not be the best way to do the job. Consideration must be given to getting accessibility to the pole line for construction maintenance and repair.

The cost of men's lives; injuries and damages expense; and the cost of replacing and training men to take the place of those who have been injured should be figured in the economics of the job. Visualize emergency conditions to make them simple. Give adequate clearance for men to work and climb through. Figure the pole alive, that the man has direct contact with the ground at all times. I think if these points are kept in mind great improvement would be made in the physical arrangements of equipment and lines.

Design of Pole Structures

With respect to pole structures, the following must be considered:

Location of transformers.

Provision for adequate climbing clearances.

Safe position of cut-outs.

Locations of secondaries for the various voltage classifications.

Safe locations of distribution lines which are built on transmission pole lines as well as distribution capacitor installations with provisions for safely grounding and short circuiting.

One point that should seem fairly obvious is the clearing up of congestion caused by the multiplicity of secondary house services from the same pole. The paramount consideration is to provide adequate climbing space from the ground to the top of the pole especially in congested installations with the multiplicity of underground circuits, street lighting drop leads, etc. More attention should be given to the design and installation of street lighting transformers and their auxiliary equipment.

Design of Secondary Systems

In analyzing a series of fatal accidents in one area of the country last year, it was found that one of the contacts in each case was with a neutral; a primary, a secondary or a common neutral. The secondaries and neutrals should be regarded as grounds and good field practice requires that they be "covered up."

The location of the secondary system far enough away from the primary system so that it would be impossible for the man to bridge his body between the two systems would be desirable if possible. One of the serious shocks recently experienced occurred on a junction pole using eight-pin arms for both line and buck arm. The conductors were six in number on the line arm and four in number on the buck, which was deadended. From this number of conductors, it would have been possible to use six-pin arms for both the line and the buck. When eight-pin arms are used it puts the conductor so far out on the arm that it is almost impossible for a man to reach the corner of the construction to make a tap.

Safety Factors in Design

Although there has been great improvement in design and construction of lines looking toward the safety of the men, it is important that careful and constant attention be devoted to such factors as:

1. Adequate climbing space—use the chimney idea for providing proper clearance.
2. Provision of space at top of pole or any working area for safe placing of feet.
3. Position of ground wire or moulding in place where lineman has to place his feet (cause of cut-outs).
4. Location of risers and service pipes —number and location must not interfere with climbing space. In this connection cooperation of other pole users must be sought to keep pole free of encumbrances.
5. Adequate clearance between transmission and distribution arms — design must contemplate trouble.
6. Convenient and safe positioning of cut-outs and lightning arrestors.

In the matter of operating practice, greater attention must be paid to the establishment and enforcement of set rules and standards for use of rubber protective equipment. Chief emphasis should always be on avoiding *primary contact.*

Another important operating procedure is the opening and closing of cut-outs or 3-phase installations in proper sequence—close the furthest one first. This is also important in "rubbering up" conductors—cover nearest one first and remove furthest one first.

We have had serious accidents when removing wires from poles without proper attention to guying. Poles may be rotted at the butt.

One very important matter that is a cause for increasing concern is the safe method of working on live lines in the 6.9 and 12-kv class, in order to avoid interruption to service. With increasing dependence on continuous electric service, it is becoming almost impossible to cut service off in order to do repair and maintenance work. While hot line tools are recognized as the safest way to do work in this class, the cost of working in this area with these tools is a big factor. Many companies are working in this area successfully with rubber gloves, rubber protective equipment, wooden covers and barriers, insulating platforms, etc. The important thing to watch here is—that we know and understand the limitations of our protective equipment —rubber gloves being a case in point. Another thing to watch is that we understand the limitations of our protective equipment under storm conditions—rain, sleet, ice.

Eliminate Hazards

Great progress has been made over the years in improved design and construction; and working practices on transmission and distribution facilities including the electrical equipment itself and the engineers and operating people *are* taking safety increasingly into consideration. However, there are still too many accidents—bad accidents. While I agree that most of these are due to human failure which can be minimized by working through our employment procedures, training programs and supervisory levels—yet bear in mind that when you eliminate the hazard, you remove the consequences of human failure.

Suggestions for Long-Range Improvement

In addition to the few specific suggestions I would like to offer the following general suggestions for long-range improvement:

(1) The safety committee of the American Institute of Electrical Engineers, and the American Society of Safety Engineers have been working to stimulate interest in safety in our engineering colleges — working through student branches and working with faculties to get safety woven into the electrical engineering courses and also to set up regular safety courses.

It is urged that utility engineers back up this effort so that our young en-

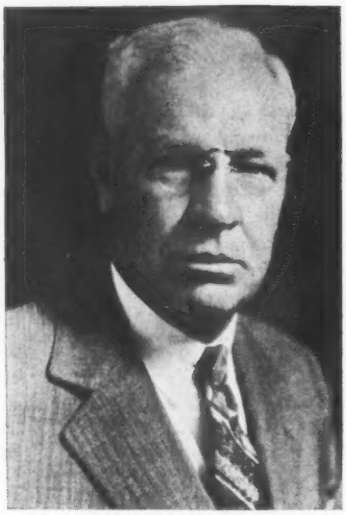
(*Continued on next page*)

J. T. Barron

JACOB T. BARRON, vice president in charge of Combined Operations and a director of Public Service Electric and Gas Company died March 12 in Alexian Brothers Hospital, Elizabeth, after a month's illness. He was 65 years old.

Mr. Barron was a member of the Board of Directors, Edison Electric Institue, and served on its Executive Committee and on the Codes and Standards Committee since 1948. He was also a member of the American Gas Association.

After being graduated from the University of South Carolina in 1905 with a bachelor of science degree, Mr. Barron took a position in the Testing Department at the Schenectady Works of the General Electric Company. During the two-year period he was with General Electric, he worked in various branches of the Testing Department. In September, 1907, when Mr. Barron went to Public Service, he was assigned to the Testing Department in Newark. From Oct. 15, 1907, to Feb. 1, 1908, he was connected with the construction department as inspector of steam turbine installation. On Feb. 1, 1908, Mr. Barron was made chief operator of substations and generating stations in the company's Central Division. He was promoted to superintendent, Central Division, in Sept., 1910, and had charge of generating stations, substations, transmission and distribution.



MR. BARRON

In July, 1919, Mr. Barron was made general superintendent of production, a title later changed to general superintendent of generation, and had charge of all electric power generation in Public Service.

Mr. Barron was promoted in July, 1926, to general manager, Electric Department, and on March 18, 1935, he was promoted to vice president in charge of Electric Operation and a director of Public Service Electric and Gas Company. On May 15, 1945, he was elected a director of Public Service Corporation of New Jersey and on Jan. 20, 1948, he was promoted to vice president in charge of Combined Operations.

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gineers will have safety definitely in mind when they graduate from college.

(2) Those companies that have training courses for engineers and even those companies which do not have such courses should make some provision for these men to spend some time in the operating and maintenance department before taking up the regular work in engineering and design.

(3) Designers and engineers should spend some time in the field actually visiting the jobs and talk with the people who have to operate and maintain them, to get their ideas and learn at first hand the problems with which they are confronted. In this way, they will undoubtedly receive many suggestions for the elimination of hazards in future work.

(4) It would be well if engineers and designers could sit in on investigations of major accidents which occurred in the line department and also attend safety meetings where accidents are discussed. At these meetings a review could be made of all serious accidents with a view to seeing whether improper or faulty design may not have been the basic cause of these accidents and to discuss ways and means of eliminating hazards.

Accident prevention has taken great strides since the early days. Today, progressive managements realize that it is not necessary for workmen to be hurt and that safety is everybody's job. The safety man is a staff man whose job it is to record, analyze, spot the trouble, consult with, and advise the line organization and keep safety considerations before the management supervisors, and the men. But the actual practice of safety is the responsibility of *all*—the foreman, the superintendent, the workman himself and, yes—the engineer, designer and operating man.

Safety "Comics" Published By Ebasco

EBASCO Services Inc. has published the first of a series of safety booklets, designed to tell the story of utility safety work to mass audiences through use of the "comic book" technique.

The series, produced for Ebasco Services by Fawcett Publications, Inc., is entitled "Captain Marvel and the Lieutenants of Safety." The artist and script writer on the original "Captain Marvel" series are doing the work on the new safety booklets.

The first booklet is called "Danger Flies a Kite" and features with color cartoon one phase of the vast precautions needed in the electric utility field for the protection of the public as well as the industry's workers.

In subsequent editions, other elements of the utility industry will be featured. According to W. T. Rogers, Ebasco safety consultant, forthcoming issues will deal with the gas industry, transportation, communications, etc. He explained that these booklets are available at moderate cost, and that there is space on the last page of each booklet for the purchaser's imprint. "In addition to employing these books to broaden the scope of safety education," Mr. Rogers said, "we are devoting a section of each booklet to the advantages and superiorities of the American way of life which has made our great utility industry possible."

Point Your Own Moral

"TOM, you need a rest," avowed Mrs. Edison, spouse of the great inventor. "You simply must go off somewhere for a vacation."

"Where would you suggest that I go?"

Mrs. Thomas A. Edison thought for a few minutes.

"I have it," she said. "Sit down in that chair and try to imagine where—in all the world—you'd most like to be and would enjoy yourself the most. Then go there tomorrow."

He did just what she told him to do. Next morning, the man who defined genius as "2 per cent inspiration and 98 per cent perspiration" went back to his laboratory.

And that was before the day of excessively high taxes, too!

—Air Conditioning & Refrigeration News.

Consolidated of Baltimore Reviews Steps Taken in Year-Old Public Information Program

WHEN the Public Information Program of the Consolidated Gas Electric Light and Power Company of Baltimore has its first anniversary this April, those responsible for its development will have made impressive headway in their efforts to acquaint employees, stockholders, and the public with the facts of life, as Americans have long enjoyed it, and "creeping socialism," the threat of government domination.

"Desert of Destruction" Feared

In the supervisory meeting at which Consolidated's campaign was launched, it was recognized that the Baltimore area was in no immediate danger of a government drive for ownership of electric facilities. But Executive Vice President Charles P. Crane* reminded the group that, if government expansion in the electric industry is not checked everywhere, "it would be foolish to suppose that our area could remain a peaceful oasis of safety in a desert of destruction."

Response to the proposed program was excellent. The supervisors asked for more information and indicated that they would help in whatever ways they could to place the facts of nationalization before all employees.

A Public Information Committee, headed by the Manager of Publicity, was appointed, its members including the Assistant to the President and the top executives of the Personnel, Advertising and Customer Relations Departments. This Committee drew up a three-stage plan for supplying information, first to employees, then to stockholders and finally to the general public.

"Test Your Knowledge"

For employees, a question-and-answer feature, "Test Your Knowledge," was started in the Company's house organ, *Folks*. Normally dry or complex subjects, such as the growth of Federally owned power projects, the reasons for state regulation, and the need for an adequate rate of return, have been presented in simple, non-technical language and, more importantly, an effort has been made to highlight what these matters personally mean to employees.

Shortly after the program began, *Folks* printed on its front page the following letter from Consolidated's President William Schmidt, Jr.:

"Fellow Employees:

"Our 'American Way of Life,' under which individuals can singly or in groups conduct private businesses for profit, promotes national progress by stimulating ambition and incentive, and is the most efficient and successful system yet devised for creating and maintaining a high standard of living and insuring individual liberty and opportunity. It has made our country the greatest nation on earth.

"Strange as it may seem, this time-tested system is today being threatened by a growing trend toward socialism. Step by step, a little at a time, our Government in Washington is assuming greater control over State and local government, private enterprise and individual liberties.

"The Management of our Company has watched this growing tendency with uneasiness. There seems to be some misunderstanding or lack of interest by the people of our country in the basic principles which make the private enterprise system work. People generally seem to be unaware of the serious trend toward socialism and what they have at stake. We believe the time has come for us to actively support a program designed to preserve and promote our 'American Way of Life.'

"We are convinced that taxpaying private enterprise under proper regula-

Test Your Knowledge

Under each of the following questions, there are several answers. Check the one or ones you think correct. For answers, turn to page 8.

1. Why does our Company—a privately-owned, business-managed utility—have stockholders?
   - ☐ So there will be someone to receive dividends.
   - ☐ Because stockholders are required by law.
   - ☐ In order to get together enough money to carry on and expand our business.
   - ☐ To provide a group from which our Management may be selected.
2. How many stockholders does our Company have?
   - ☐ 1,000 ☐ 9,000 ☐ 17,000 ☐ 25,000
3. In which of the following groups does our Company have the largest number of stockholders?
   - ☐ Individual owners.
   - ☐ Insurance companies, savings banks and all others.
4. In how many States do our stockholders live?
   - ☐ 5 ☐ 23 ☐ 32 ☐ 48
5. Do our stockholders have any say in our business which affects you as an employee?
   - ☐ Yes ☐ No

One of a monthly series of Question-and-Answer features appearing in Folks, *house organ of the Consolidated Gas Electric Light and Power Company of Baltimore, as part of its Public Information Program. For the answers to the above questions posed in the January, 1950 issue of* Folks, *turn to the following page in this magazine.*

* EDITOR'S NOTE: At a recent meeting of the Board of Directors, Charles P. Crane, formerly Executive Vice President, was elected President to succeed William Schmidt, Jr., who retired as President, but was elected to continue as Chairman of the Board and Chief Executive Officer of the Company.

tion can do a better job of operating a business and provide a higher standard of living for the public than Government can. We believe that opportunities for employees generally are more favorable in business-managed companies. We are anxious to have you and our customers and stockholders as well known the reasons for our belief in this matter and we are going to tell these reasons.

"All statements made will be based on facts. There will be no misstatements and no half-truths. We will tell how our business operates; we will show what we are doing for our community; we will point out the dangers of government invasion in business and correct misstatements by those who are trying to socialize our country.

"As employees of our Company, we want you to help in our program. We want you to have the facts so that you can form your own judgment as to what is right and what is wrong.

"From time to time in 'Folks,' by pamphlets sent to you personally and through various other channels, we will keep you informed. Your questions will be invited.

"Our country is the greatest country on earth. We all want to keep it that way."

Folders mailed to employees' homes have emphasized the accomplishments of business-managed, tax-paying utility companies. The hours of work required to purchase everyday necessities under private enterprise, socialism and communism have been shown pictorially both in these folders and in *Folks*.

The rise of socialism and what to do about it is the topic of the season for officers and other top Company executives who are currently addressing employee Service Clubs. Abstractions are carefully avoided; every talk is keyed to the benefits employees have gained from the private enterprise system and the freedoms they would lose in a socialistic state.

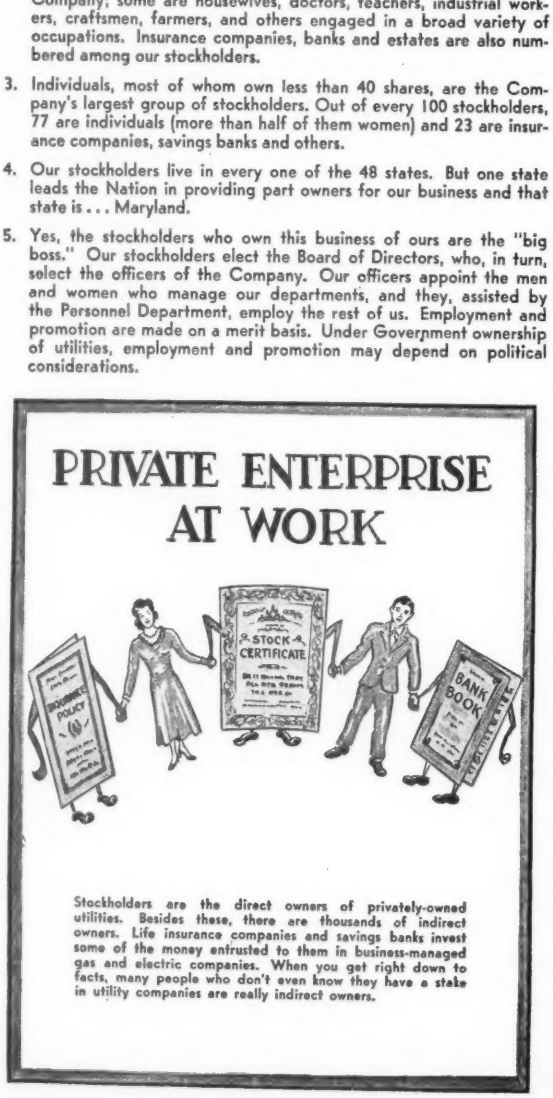
Last fall a special series of plant visits were arranged for employees and their families. These Open House days were designed to accomplish two purposes: to give employees who attended—especially those in clerical positions—a greater sense of belonging; and to "show-by-seeing" that the Company is going efficiently about its job of supplying good utility service. Souvenir booklets, emphasizing that the Company's plants are a symbol of the American tradition of

(*Continued on page* 101)

Answers To Test Your Knowledge

(Questions on Page 2)

1. Our Company has stockholders in order to get together enough people with enough money to carry on and expand the business. This makes it possible for many people, who are willing to risk part of their savings, to become part owners by investing in one or more shares of our stock. As part owners of our business, they share its profits or its losses. Their money is combined with the money we borrow from bondholders (who would not loan their money unless others had provided risk money) to buy machines, tools, plant and other facilities needed to supply good gas, electric and steam service.
2. Our Company is owned by about 25,000 stockholders who have purchased a part interest in our Company. As individuals, they represent a cross-section of America—some are employees of the Company; some are housewives, doctors, teachers, industrial workers, craftsmen, farmers, and others engaged in a broad variety of occupations. Insurance companies, banks and estates are also numbered among our stockholders.
3. Individuals, most of whom own less than 40 shares, are the Company's largest group of stockholders. Out of every 100 stockholders, 77 are individuals (more than half of them women) and 23 are insurance companies, savings banks and others.
4. Our stockholders live in every one of the 48 states. But one state leads the Nation in providing part owners for our business and that state is . . . Maryland.
5. Yes, the stockholders who own this business of ours are the "big boss." Our stockholders elect the Board of Directors, who, in turn, select the officers of the Company. Our officers appoint the men and women who manage our departments, and they, assisted by the Personnel Department, employ the rest of us. Employment and promotion are made on a merit basis. Under Government ownership of utilities, employment and promotion may depend on political considerations.


PRIVATE ENTERPRISE AT WORK
INSURANCE POLICY
STOCK CERTIFICATE
BANK BOOK
Stockholders are the direct owners of privately-owned utilities. Besides these, there are thousands of indirect owners. Life insurance companies and savings banks invest some of the money entrusted to them in business-managed gas and electric companies. When you get right down to facts, many people who don't even know they have a stake in utility companies are really indirect owners.

Additional facts on free enterprise are included with the answers to the questions appearing on the previous page, as reproduced from the January, 1950, issue of Folks.

Aerial Surveying for Transmission Line Construction

By J. S. Maloy

Chief Engineer of Lines, West Penn Power Company

A paper presented before the Transmission and Distribution Committee, EEI, Detroit, Mich., February 20, 1950

AN OUTLYING section of our territory around Bellefonte and State College was being supplied over three 44-kv lines. Early in 1948 it became apparent that additional capacity would be required to serve this portion of the territory. Studies were initiated and late in 1948 it was decided that a 132-kv line would be constructed from Ridgway to Milesburg and a 40,000-kw generating station constructed at Milesburg.

Helicopter Aids Reconnaissance

The air line distance between Ridgway and Milesburg is 60 miles, all of which is located in the Allegheny Mountains and approximately 80 per cent is through forest land. Much of this territory is very sparsely settled and very few good access roads were available. A ground reconnaissance was deemed impracticable so in July, 1948, a helicopter was employed to pick possible routes. Our civil engineer, G. B. Hoffman, was assigned the duty of flying the territory and selecting a location for the line. Three flights, all in one day, were made; the first flight was used largely to orient the pilot and observer while the subsequent flights were used to select a location and check it.

The helicopter is particularly well suited for this purpose since you can tell the pilot to "stop here a minute, I would like to look around." When you can literally hang on a sky hook and see several miles in all directions, it is possible to work out most any kind of situation. The route selected was plotted on Agriculture Department photographs and using these photographs, estimates were prepared giving costs for construction of the line.

These costs, plus data secured from other groups, were turned over to the System Planning Department who prepared a report for management. In November, 1948, management decided that the line should be built and we in the Lines Department were notified that the line must be completed and in operation by January 1, 1950. There, then, was our Christmas present for 1948—62 miles of 132-kv line to be completely engineered and built over rugged, inaccessible terrain in 13 months.

It didn't take long to figure out that our conventional methods of buying rights-of-way and doing civil engineering would not work if the time limit was to be met. We had topographic maps and a set of aerial photographs with the proposed location of the line plotted on them, one 4-man survey crew which could be used, and no experience with outside surveyors. Even if four or five survey parties could be lined up we did not think we could make the time limit because most of the work would have to be done in mid-winter.

Contour Mapping by Aerial Photography

The only out we could see was the use of aerial photography, although we knew of no cases where it had been used in the manner we deemed necessary. Robert A. Cummings, Jr. & Associates of Pittsburgh said they would tackle the job for us although it would be something new for them. They had produced contour maps of large areas from aerial photographs but they had never made an accurate contour map and profile for a 30-ft strip. However, they were confident that they could do a satisfactory job for us.

Purchase of Rights-of-Way

As stated before, we had plotted the proposed center line on a set of Agriculture Department aerial photographs and about the middle of November, 1948, we gave a set of these to the right-of-way agents to purchase the rights-of-way. This procedure was new to them but after a short time they were of the opinion that they were better than the sketches and line plans they had formerly used.

As rights-of-way were secured, property lines and owners' names were placed on the photographs. Actually about 35 per cent of the right-of-way was on State land and we were able to secure this right-of-way by furnishing them with a set of photographs marked with an approximate center line.

When sufficient right-of-way had been secured to assure the basic route of the line, we started to actually locate the center line on ground. This was necessary for two reasons; first, the aerial photographers had to know the exact location of the center line; and second, the clearing crews had to have a center line established for clearing. Locating a center line in open country would not be too difficult but in this country when you were on a hill top all you could see were the trees around you.

Since we had already thrown normal routines out the window, we decided to continue to ignore tradition by locating the center line at night. We picked points on the line that could be positively located and we went out at night and set our transit at one point and took a sight on a beam of light sent up from the second point. Wherever possible we used angle points or other control points on the line with particular emphasis on points of high elevation.

Night Surveying

To do this night surveying we used a transit, good binoculars, a surplus battery-operated Navy signal light, a "Half-mile Ray" spotlight and two-way portable radio for communication. The ideal situation was obtained by placing both the transit and the light at points of such elevation that there were no obstacles between them and a sight could be taken directly into the light. Unfortunately this condition was seldom possible.

In most cases the transit and light were on reasonably high points but with one or more high points between them. In these cases we cleared the trees from a small section in front of the transit so that a sight with a minimum vertical angle was possible and likewise made a clearing around the light and sighted on

a beam of light projected upward. We early learned that a good night for this work was a cloudy one with low hanging clouds and preferably with a slight drizzle of rain. Even on an ideal night there generally was not sufficient contrast to take a sight through the telescope of the transit, but the instrumentman sighted over the top of the telescope and set it on the beam of light and this proved surprisingly accurate.

Preliminary Line Staking

Many sights were on the order of five miles in length and when the lines were cut through, the line generally came within five or six feet of the light location. Before leaving a location stakes were set on the line as far as practicable from the transit in order that the tangent could be established for later extension to the light location. These extensions were later made in the daytime with a minimum of cutting since in every case the lines came out within a few feet of the objective.

In discussions with the aerial survey engineers it was brought out that if they were to provide us with an accurate profile along our center line it would be necessary for us to provide completely accurate information as to its exact location on their photographs. This was not difficult in open country where tie distances could be given to roads, buildings, streams, etc., but in the densely wooded areas some other means of location had to be used. This was solved by having tree-clearing crews cut out 100-ft squares at each angle and control point location. To our complete amazement, however, most of the center line we had established was visible on the aerial photographs taken at a height of 14,800 ft.

Survey Flight

The picture-taking flight was made on the 29th of March, 1949, and the first section of profile was delivered to us on May 2nd. In this process the photographs were taken so that there was a minimum of 55 per cent overlap between adjacent pictures, thus there are at least two photographs which show any given point on the line. Glass plates of the two adjacent photographs are placed in the Kelsh Plotter and focused so that a single image is projected from the two plates by filtered light. This image is projected on to a movable platten, in which there is a pin hole for a beam of white light projected from below the platten. When viewed through bicolored glasses a minute ball of white light appears and the platten is adjusted in height until this ball of light appears to rest on the surface of the ground.

In order to orient the plotter there must be points of known elevation on the picture to establish a datum. Having set the platten by way of the known elevation, the elevation of any point on the picture can be read from a meter attached to the platten. In the preparation of a contour map, the platten is adjusted to a given contour elevation and then is moved around the model to follow the chosen contour line which is traced on a plastic film as the instrument is moved along the contour line. For the preparation of a profile for our use, the contours were traced for approximately 100 ft each side of the center line and the profile prepared by projecting the point of intersection of each contour line with the center line to the profile plate below the plan section of the plan and profile cloth.

Comparison With Ground Survey

Incidentally, this plan and profile was produced on the same scale and in the same manner as the plan and profile which we would normally prepare from field detail and level notes. The only difference being that on the profile produced from the aerial pictures only the center line profile is shown, whereas, on our standard profile we show center line and 15 ft right and left of the center line. The information as to any side slope can be obtained from the contour detail on the plan section of the plan profile taken from the aerial pictures. Actually, we found the contour lines on the plan very helpful in grading the line as it shows distinctly the topography at any point in any span.

To produce 10-ft contours the flight was made at a basic elevation of 14,700 ft, which produces a model at 400 ft to the inch. The contours and topography were produced on a plastic sheet to the 400-ft scale and then this detail was enlarged photographically to the 40-ft scale. In order to assure the accuracy of this enlargement the 400-ft plastic had a base line accurately marked in one-inch lengths placed above the detail, this base line was then checked on the enlargement to be certain that the markings were exactly ten inches apart. This photographic enlargement was then traced on to the plan and profile cloth.

As in the case of the elevations where points of known elevation are requi it is also necessary to have feature known horizontal separation in orde establish the horizontal scale accura Where there are improved highw this can be obtained readily by refer to the highway plans or if railroads pear on the picture the same informa can be obtained from the railroad p There were some stretches of this where there were neither highways railroads available so it was necessar use the Coast and Geodetic Triangu tion point and Grid system for a h zontal check. As an indication of accuracy obtained, a check made aga triangulation points approximately 000 ft apart in the area where th were no roads or other available che showed a discrepancy in distance taken from the aerial photos of 17 ft.

Field Checks on Profile Accuracy

We made several checks in the f on the accuracy of the profile and in specific case we checked the profile o the Pennsylvania Railroad switch bac and found that from the upper track the structure location on the Milesb side, which has an elevation of 1712, the profile proved to be 1712.4, based an accurate line of levels run from track to the structure location, and the other direction to the struct shown on the profile as elevation 140 we could find no variation with our l of levels.

Probable Accuracy of Aerial Survey

It should be stated, however, that t Cummings Company representatives f that accuracy of this order is beyond t normal expectation of photographic wo of this scale, but they do maintain th for 10-ft contours 90 per cent of points on the line will be within five f in elevation and with a probable acc racy of within three feet of elevati with the maximum accuracy being o tained on the higher points, since we told that it is more difficult to determi elevations in the bottom of valleys a other indentions in the earth's surfa For the process of grading a line we a more interested in the knolls and hillto as points of possible critical clearance, elevations taken from air maps are ve useful to us.

Having received the plan and profi from the aerial survey we had anoth new problem. The plan showed li stationing but we had no such station

the ground since we had done no ining of the center line. We graded line on the profile showing structure ations but how were we to know en we went out to stake structures t exactly where, along the line, is sta- n 210+80, for instance. This proved be quite interesting and ultimately it rked out as a good check on the accu- y of the profile.

We ran a print of the profile roll and t it to the staking crew. Structures re located by measuring from a road, e, drain, edge of woods, fence or er recognizable feature which had a e plus on the plan. Where no such tures were available we might note t a structure was eight feet in eleva- n below the crest of a knoll and the xt one five feet below on the other e so we would run levels down from e crest to each elevation and measure e span as a check. Such checks were azing: the spans never varied more an a few feet from the span plotted on e profile.

Advantages of Aerial Surveying

The use of aerial surveying on this , as we pointed out, has not been thout a few problems which we did t face in our normal procedure, but it s taken away many problems which e would have faced in our normal utine on this job. It enabled us to send e plans to the construction department less than six weeks after the date from e photographic flight; it made possible e complete civil engineering of this line approximately 62 miles, including the al staking of structures, in approxi- ately seven months' time by one survey ew.

Construction of this line has now en completed and it was placed in eration on December 31, 1949, and e grading has proved by construction at the use of aerial photography for ofiling a transmission line is practical d accurate. Without the use of the rial photographs, we feel quite certain at we would not have finished the con- ruction of this line before the end of 950.

We are proceeding with the construc- ion of a similar line from Ridgway to arns City, on which the civil engineer- g is being done in the same manner. We can report that as a result of our xperiences on the Milesburg-Ridgway ine, we are operating much more moothly and will complete the center ine and grading of this 60 miles in approximately four months or even less.

In dollars and cents, although we do not yet have final figures, we believe we will save something of the order of 50 per cent over normal civil engineering expenses for work of this type, but most of all we have saved at least a year in time. It should be pointed out that the cost of the aerial survey would probably be appreciably higher per mile on a shorter job, since one of the basic costs is getting the airplane to the location and back to its base, with the amount of flying it does in connection with the photographs being generally an incidental matter, however, we believe that this method of surveying will have many applications as yet unthought of and we will all come to make greater and greater use of it.

In conclusion, I would like to point out some limitations to aerial surveying. In wooded country photographs must be taken when leaves are off the trees and with little snow on the ground. In Pennsylvania the best months for photographing are March and October because the leaves are off the trees then and the sun is in the best position. This method cannot be used in areas where heavy concentrations of evergreen trees are prevalent.

Simplified Financial Reports to SEC May Save $500,000 Annually

(*Continued from page* 74)

provement and simplification of such reports."

Its members are: W. G. Bourne, Jr., Commonwealth Services, Inc., *Chairman;* E. H. Gannon, Stone & Webster Service Corp.; A. E. Softy, Commonwealth Services, Inc.; Douglas Tonge, American Gas & Electric Service Corp.; T. G. Sommermann, Ebasco Services, Inc.; William Storz, Philadelphia Electric Co.; H. C. Hasbrouck, Edison Electric Institute, *Secretary*.

While all the men above represent organizations which are members of the Edison Electric Institute and American Gas Association, and its secretary is a member of the Institute's staff, the Committee is not a committee of either the Institute or the Gas Association. It is wholly a creation of the Advisory Council on Federal Reports, which in turn has been established by the Director of the Bureau of the Budget.

Subsequent to the appointment of the foregoing, the Controllers Institute of America, one of the bodies jointly sponsoring the Advisory Council, was asked to designate a representative to cooperate actively with the Committee, and named Leith V. Watkins, Controller of the Panhandle Eastern Pipe Line Company, to sit with the Committee and participate in its work.

During the summer and fall of 1949 the Committee was very active. Detailed studies were made of various S.E.C. report forms and requests for suggestions were mailed to correspondents throughout the two industries. The Committee then discussed these studies and suggestions and embodied those which it finally agreed upon in recommendations to the Bureau of the Budget. On October 3, 1949, a conference was held in Washington at the office of the Bureau of the Budget under the auspices of David E. Cohn, of the Budget Bureau's Division of Statistical Standards. It was attended by all members of the Committee, including Mr. Watkins, representing the Controllers Institute, and by various members of the staff of the Bureau of the Budget, the Securities and Exchange Commission, and the Federal Power Commission. This meeting was chiefly useful for clarifying and reconciling the ideas and recommendations of the Committee with those of the S.E.C. staff. Undoubtedly the discussion had its effect on changes subsequently made in S.E.C. report forms.

The Committee has summarized its work in a brief report to all member companies of the Edison Electric Institute and the American Gas Association. This report includes a list of the Committee's principal recommendations showing which of them were adopted. The Committee has also prepared detailed comparisons, so far as practical, item by item, of the revised forms with those superseded. A limited number of copies of these detailed comparisons are available on request to Russell Schneider, Executive Secretary, Advisory Council on Federal Reports, 1615 H. Street, N. W., Washington 6, D. C.

Flux or Ring Testing of A-C Synchronous Machine Armatures

By Harris Barber
New England Power Service Company

A paper presented before the Electrical Equipment Committee, EEI, Cincinnati, Ohio, February 14, 1950

THE flux testing of synchronous machine armatures was brought to the attention of the Electrical Equipment Committee by Mr. L. Birckhead of the Consolidated Gas Electric Light and Power Company of Baltimore in 1947 in connection with repairs to the armature of a 60,000-kw turbine generator. Since that time we have made use of the test on the New England Electric System in the cases of some half-dozen machines of varying years of manufacture.

Test Procedure

The test consists of winding a sufficient number of turns of insulated cable around the outside of the stator frame and through the center space normally occupied by the rotor and applying such relatively low voltage to this coil as will produce approximately normal flux density in the armature core iron. When this is done, it will result in sufficient localized heating of any damaged or short-circuited core laminations to be sensible to the touch, or in the case of severe shorting to be visible to the eye because of smoke from adjacent hot core insulation. A further method is to coat the laminations with wax and observe for melting of the wax at the damaged points.

Test Applied After Repairs

The first of these tests was made in 1947 on a 10,000-kva, 11-kv synchronous condenser installed in 1930. A field-pole connection strap had broken, one end had been thrown outward radially by centrifugal force so that it scraped the armature iron and a large amount of melted copper was deposited on the core laminations. After removal of the copper particles and cleaning of the laminations, the flux test was applied to insure that no shorted laminations remained.

In March, 1948, a flux test was made on a 20,000-kva, 13.8-kv turbine generator of 1919 vintage during a scheduled overhaul. Considerable loose iron was found and the flux test was used to check the stator iron after repairs by wedging were completed.

The third use of the flux test was in July, 1948, in connection with the scheduled removal of the rotor of a 40,000 kw hydrogen-cooled generator which was put in service early in 1941. In this case heating was observed with less than half normal flux in the stator.

In August of 1948 the flux test was applied to a 12,500-kw turbine generator installed in 1919. The armature winding failed in the end-turn section and the flux test was used to check for iron damage. In this case no damage was found.

During the summer of 1949 a 7500-kva, 13.8-kv condenser was rewound after armature coil failure. In the process of rewinding it appeared that some lamination damage had been sustained. The flux test showed about two square inches of laminations which attained about 15 C rise over the remainder of the stator. This rise was not excessive but was reduced by wedging with mica.

Flux Test on Waterwheel Generator

In September, 1949, a 17,000-kva, 6.6-kv vertical waterwheel generator was dismantled for a scheduled rewinding of the armature. This machine was installed in 1928. On this unit the flux test showed minor heating of the order of 15-20 C above the rest of the iron in an area where the lamination dovetails had pulled away from the stator frame in prior years.

Additional use of the flux test was made under somewhat unusual circumstances about a year ago. During a factory visit for another purpose our electrical engineer was shown one of our new turbine-generators being wound on the assembly floor. A considerable number of areas where the stator laminations appeared bent or distorted was observed. A flux test was requested and performed as a check on the situation.

In one of the tests mentioned abo the armature leads were short-circuit and grounded without any observa current appearing on the armature a meters. This would seem to indic that for this type of test no appreciab net voltage is generated in the armatu phase windings even though the test made with the windings in place. (the particular machine in question abo a quarter of the magnetic slot wedg were not in place at the time of test.

Normal Induction Present In Test

An indication as to whether or n normal induction is present was disco ered when it was noted that considera voltages existed lengthwise of the co when the test coil was energized. On 13.8-kv generator with a test coil of turns, 234 amperes, 613 volts, 11 ampere-turns, the voltage from end end of the armature core measured 1 volts. This is the same voltage as wou be induced in one turn of one coil si of the machine at the same flux densi and when multiplied by the number coil sides per phase in the machine, ga a value of the order of 8000 volts whi is the rated phase-to-neutral voltage the generator.

Conversely, if the number of tur per phase of a machine is known, twi this number divided into the phase-t neutral voltage gives the voltage whi should be measured from end to end the core when normal flux is induced it. Prior to the above observation, in cation of saturation which in turn d noted at least normal flux present in t core had been based on successive rea ings of apparent test coil impedance wi varying number of coil turns on t basis that the impedance varies as t square of the number of turns of the te coil until saturation is attained.

Core Saturation

The number of turns of the test co required to produce saturation of t

(*Continued on page* 94)

How Television Receiver Load Affects The Electric Power Company

By W. L. Lawrence
Radio Corporation of America

A talk before the Transmission and Distribution Committee, EEI, Detroit, Mich., February 21, 1950

TELEVISION has grown so spectacularly in so short a time that its relation to its sister services warrants careful analysis and continued study. This session is proof that electric company engineers are aware of television's impact on their field.

In considering television receivers from the standpoint of their effect on an electric company, it is convenient to consider them as a home appliance. A consideration of the following matters is then in order:

1. Characteristics
2. Size of Load
3. Rate Structure
4. Daily Use Factor
5. Frequency Requirements
6. Regulation

Characteristics

The power consumption varies with the size of the set from approximately 160 watts for a 7-inch size picture tube up to 340 watts for a 16-inch tube. A consideration of the distribution of sizes and the variation in power consumption between different makes of receivers leads to the conclusion that a representative value for the energy consumption of a "typical" receiver is 250 to 280 watts, say 265 watts.

There are two factors tending to change this value as the industry progresses. Design improvements, aimed primarily at cost reduction of the receivers will result in some slight reduction in power consumption. Opposed to this factor is the public's tendency to prefer receivers with large size pictures. These receivers require more power. Whether these factors will exactly counter-balance each other or whether one or the other will predominate is a problem whose solution must be left to the future.

The power factor of television receivers is 95 per cent or better. The secondary loads on the power transformer are of two kinds: the straight resistance of the filaments or cathode heaters of the tubes and the unity power factor load represented by the full wave rectifier that supplies plate power for the vacuum tubes. The only thing that contributes any reactive load is relatively low leakage reactance of the power transformer.

Due to the low resistance of the cold heaters when the set is turned on, an initial surge results. This surge is approximately twice the steady state load and lasts for approximately one second. A good detailed analysis of the input power requirements of television receivers appears in the April, 1949, issue of *Electrical Engineering*.

Size of Load

The present number of television receivers in the hands of the public is 4.4 million. Most of the authorities in the industry estimate the number to be sold in 1950 as between 4.5 million and 5.0 million. This would indicate a total number of 8.5 to 9.0 million by the end of the year.

A particular utility is most directly interested in the set population and growth factors that apply in the area or areas it serves. The deduction of such figures is at best an inexact operation. However, Table I shows the rate of growth over the past year of the national set population and the set population for six representative areas. It is interesting to note that since last fall, the national set population has increased at the rate of roughly half a million a month.

TABLE I—MONTHLY GROWTH OF TELEVISION RECEIVER POPULATION

	Dec 1 '48	Jan 1	Feb 1	Mar 1	Apr 1	May 1	June 1 (Thousands)	July 1	Aug 1	Oct 1	Nov 1	Dec 1	Jan 1 '50
New York	370	410	450	500	535	600	650	685	720	800	875	950	1,015
Boston	32.9	35.3	45.1	53.6	68.4	81.4	95.7	105	113	146	177	213	248
Richmond	4.6	5.7	6.9	7.7	9.0	10.2	11.5	13.1	13.7	15.5	16.8	18.6	20.9
Milwaukee	11.3	14.2	16.2	19	21.6	24.5	26.7	28.4	30	41.1	50.1	60.6	72.2
Detroit	22	32	39.5	43.5	50.5	55	60	72	76	90	129	138	145
St Louis	14	15.5	20.	22.5	25.5	28.9	32.1	35	36.8	49.5	57.6	67.7	77.8
National Total	800.2	932.5	1,082.1	1,241.9	1,395.9	1,605.6	1,784.9	1,945.3	2,092.7	2,589.3	3,006.5	3,486.4	3,946.8
No. Stations On Air	47	51	54	55	59	61	66	72	75	83	88	94	98

Rate Structure

Since the vast majority of television receivers are used in homes, they consume electricity at the favorable domestic rate. Conversely, the most intensive use of television receivers occurs during the evening peak load hours and this tends to increase the daily peak load. The consideration of the appliance character of a television set leads us to a consideration of the daily use factor.

Daily Use Factor

It appears that a reasonable minimum value for the average daily hours of use is three. A somewhat optimistic value is five. These figures give for an average power consumption of 265 watts daily energy consumptions of 0.795 kwhr and 1.325 kwhr, respectively. This leads to the rough rule that a television set accounts for 1 kwhr of energy per day.

In thinking about the daily use factor, it is helpful to enumerate some of the factors that tend to decrease and increase the daily hours of use. One factor that tends to decrease the hours of use is the fact that television is a voracious consumer of leisure time. The factors that tend to increase the hours of use are:

a. Unlike other household appliances, such as a washing machine, ironers, stoves, etc., there is not the element of "duty" connected with the television receiver. The use of a receiver is considered entertainment without the connotation of chores or other household duties.
b. The not inconsiderable cost of a television receiver encourages its intensive use.
c. The theory that television cannot be used as "background" for other activities has been proven to be untrue for certain types of programs and competing activities. For example, during the telecast of a sporting event there are times when the action drags, *i.e.,* during intermissions or "time out." It is possible to engage in other limited activities such as some types of reading, short-time chores, etc., during these periods. In this connection, the difference in observer attitude toward television should be noted. Since the entertainment is "free" there is not the same feeling of compulsion to see all the program, if the possibility of other activities exists. However, during the interims, the set is left turned on to insure that no climaxes or dramatic moments escape.
d. The introduction of children's programs during the late afternoon hours also tends to increase the daily hours of use. Such use of the set utilizes off-peak power.

Effects on Lighting Load

It should also be noted here that evening use of a television receiver should not appreciably reduce the residential lighting load. The avoidance of glare with present picture brightnesses demands that some room lights be left on.

At this point it is interesting to estimate the dollar revenue to public utilities resulting from television receiver use. We perform two calculations, one pessimistic and one optimistic:

No. of Receivers, Millions		*kwhr/day*		*days/year*		*cents/kwhr*	*Annual Revenue, Millions*
4.4	×	.795	×	300	×	.035	$ 36.7
8.5	×	1.325	×	360	×	.035	$142

Frequency Requirements

The preferred frequency is 60 cycles although many receivers are designed for 50-60 cycle operation. Operation at 25 cycles would require a redesign due primarily to the much greater weight and bulk of power transformer and secondarily to the need for better filtering with 25-cycle supply. The relatively small number of sets would also operate to make the price unattractively high. Some of the smaller receivers are designed for operation on d-c. For most of the receivers, 60 cycle is a must. This may prove to be a factor in increasing electrification in those rural areas that have or will have television service.

Regulation

The desirability of low regulation is emphasized by the unique visual aspect of a television receiver. Since the size of the picture is a function of the supply voltage, the set is, in effect, a visual line voltage monitor. Unfortunately, although it is a critical monitor, it is not an accurate one.

Most receivers have picture size adjustments which permits adjustment of picture size so that for any particular value of line voltage, the size can be adjusted to make the picture just fill the mask opening. However, any departure from the voltage at which the size controls were set will cause a change in the size of the picture. Since the observer will instinctively compare the varying size of the picture with the fixed size of the mask opening he is apt to be unconsciously over-critical of line voltage changes.

A second factor bearing on line voltage changes is the variation of amplifier gain with line voltage. For areas that have low signal strength, the low amplifier gain at low line voltage may cause excessive "snow" (random noise effect) in the picture.

Voltage dips or surges due to across-the-line starting of larger size motors result in a combination of flicker (momentary change of picture brightness) combined with change of picture size. Again, the visual character of television makes these phenomena more noticeable than for other electrical equipment. It should be noted that some of the larger, more costly receivers include a voltage regulating transformer, which reduces or eliminates the effects of poor regulation. However, for economic reason such transformers are not used with th moderate priced sets aimed at the ma market.

RCA Victor television sets are de signed for an average line voltage o 117 volts and are rated to give satis factory performance over a range o voltage from 105 to 125 volts. Ou experience shows that this range of volt age is commercially satisfactory. Th comments of the meeting are sought a to whether or not 117 volts is a goo representative value for design purpose

The following summary of the effect of high and low line voltage may b helpful in assessing the effects of exce sive regulation:

Low Line Voltage: The picture ma not fill the receiver mask opening. I locations of low or marginal signa strength excessive picture noise o "snow" will result.

High Line Voltage: The picture ma more than fill the receiver mask openin so that information near the edge of th picture will be lost. Excessively hig line voltage may cause premature failur of the electrolytic filtering condense If marginally rated components (usuall resistors) are used in the set, excessiv line voltage will contribute to thei premature failure.

In closing I want to repeat our ap preciation of this opportunity to presen the receiver manufacturers' views on th relationship between receivers and pub lic utilities. I trust that this presenta tion will assist you in arriving at a accurate and helpful basis on which t assess your relationship to television.

It Can Be Done!

DON'T let anybody tell you
"There's no poetry"
In a financial statement.
Somebody
With Western Massachusetts Electric
Company
Wrote 172 lines of free verse
Around the "total income" line
In the Company's 1949 Annual Report
Good verse, too,
That's worth repeating.
And there it is,
On the opposite page,
Just as it appeared
In Western Massachusetts *Hi-Lines.*

How did we do in 1949

HOW did our Company
Make out last year?
Financially, that is.
When you looked over
The Annual Report
Sent you last month
You didn't see any red ink.
So, perhaps, you figured
That the Company had something
Left over for the year
After paying our wages
And for coal, supplies, taxes, interest,
Dividends, etc.

* * *

That's right.
There was something
Left over from earnings
After providing for all the
Immediate costs
Of doing business for the year
Some people would
Call that a profit.
And they would be right
If they were speaking of
A private industry
Or a personally owned business.

* * *

But with a public utility
It's different.
Did you notice what it says
Up above?
The something left over
Was "after providing for all
The *immediate costs*
Of doing business."
What does that mean?

* * *

Well, let's consider
How a public utility
Differs from a private industry
Or a business that's personally owned.

* * *

A private industry can be run
Pretty much as its owners
See fit.
It can make as much money
As their ingenuity
And skill may provide.
Or it can pack up
And move away, or it can
Go bust. Or just plain
Go dead in its tracks.

* * *

It can commit
Financial suicide
By paying out the bulk
Of its earnings in wages
And dividends, and neglect to
Set something aside for
New machinery to replace
The old and antiquated,
Or to take care of emergencies.
And the owners don't have to stay in
Business if they don't want to.

* * *

Not so with a public utility.
Its charges
For service to its customers
Are regulated by
Government commissions.
What it can earn
Is pretty well controlled.
And what it can pay
In dividends
Comes under the eagle eyes
Of these Commissions.

* * *

And besides that,
The public utility
Must stay on the job
And provide continuous service
To thousands of customers
Of every conceivable kind
No matter what happens
Come hell or high water

* * *

And when
Something does happen
The public utility must have
The money, the men and
The facilities
To restore its property and equipment
Pronto.

* * *

That is why
It must have
Something left over
From its earnings.
If it didn't
It would dry up
And none of us would have a job.
Nor would our customers have
electricity
For their daily needs.

* * *

Let's see how much was left over
And what happened to it.
First —
There's the matter of income
Or how much money the Company
took in.
The total income was just under
17 million dollars
($16,926,158 to be exact).
That's a lot of dough
When you say it quick
And don't stop to consider
What has to be done with it.

* * *

What *was* done with it
Is quite a story,
But to make it short and simple
Almost 14 million dollars
Were spent to keep the business going.
These 14 million bucks
Were needed for all those costs
Generally called operating expenses,
Repairs and upkeep, depreciation
And taxes.
And, get this.
Taxes ($3,364,102)
Were nearly as much as
Our wages of
$3,864,886.
How do you like that?

* * *

Simple arithmetic shows that
This leaves about 3 million dollars
But —
Interest on long-term debt
And the like
Took half a million,
Which left a
"Balance Available for Dividends
and Surplus"
Of 2½ million dollars.

* * *

Close to 2 million — in cash —
Went to the shareholders as rent
(At the rate of $2.00 per share)
For the use of their money
That bought the properties and
equipment
With which we work.
There are 12,721 of these shareholders,
Mostly people like us.
No one owns more than
2.4 per cent of all the
Shares of stock.
It is the money
Of these people invested
In our Company, that
Over a period of years
Has made our jobs,
And will make more jobs
As the years pass along.

* * *

A little over a half a million
($616,106) was left over
As the "Balance for the year."
That balance was tucked away
As insurance for a "rainy day."
So into the kitty it went
To take care of unforeseen emergencies
That may lie ahead.
We all know what terrifically
Costly damage
Floods, hurricanes, ice storms, etc.,
can do.
Remember what happened in
1927, 1936 and 1938?

* * *

Now, where do we stand?
We're in a good, solid position,
Financially and physically.
And we're working as a team —
Employees, shareholders and
management —
To serve our real bosses,
The customers,
And, as a result,
Make our jobs more secure.
Brother,
That's worth a lot!

From Western Massachusetts Hi-Lines—See note on opposite page.

A. D. Colvin

ALLAN D. COLVIN, president and director of the Connecticut Power Co., and a director of the Hartford Electric Light Co., died on March 11, at Hartford, Conn. He was 66 years old.

Mr. Colvin had become president of Connecticut Power Co. in March, 1949, after serving for twenty years as executive vice president of the company.

Born in Troy, N. Y., Mr. Colvin received his education at the Rensselaer Polytechnic Institute, graduating as a civil engineer in 1906. His subsequent career was closely identified with the development of the gas and electric industries.

His early practical experience came as personal assistant to Dr. William L. Robb, famed physicist and consulting engineer. From 1907 to 1909, Mr. Colvin was assistant superintendent of the electric department of the Troy (N. Y.) Gas Co. In 1909, he joined the faculty of R.P.I. in the electrical engineering and physics department, leaving to join the Hartford Electric Light Co. as assistant to the general manager in 1911. He became general manager in 1921 and served in that capacity in Hartford until 1929 when he went to New London upon being chosen executive vice president of the Connecticut Power Co.

MR. COLVIN

Mr. Colvin was a trustee of the Rensselaer Polytechnic Institute, a member of the American Institute of Electrical Engineers and the Rensselaer Society of Engineers. He was also an incorporator of the Savings Bank of New London and a director of the United Welfare Fund, Inc., of that City.

C.I.G.R.E. Conference to Be Held in Paris, June 29-July 8, 1950

AT a recent meeting of the U. S. National Committee of C.I.G.R.E. (International Conference on Large Electric High-Tension Systems) plans were formulated for United States participation in the 13th Biennial Session of C.I.G.R.E., which is to be held in Paris from June 29 to July 8, 1950.

These Conferences are attended by 1500 delegates from 40 different countries and are devoted to a discussion of all problems relating to the generation, transmission and distribution of electric power. They are of particular interest to executives and design and operating engineers in both the electric power and electric manufacturing industries.

There are 120 technical papers to be presented at the June Conference of which 16 will be of U. S. authorship.

Arrangements have been made for a large and representative United States delegation, many of whom will remain for the Fourth World Power Conference to be held in London, July 10 to July 15, 1950. Also, the Swedish State Power Board has invited all U. S.-C.I.G.R.E. delegates for a tour of electrical installations in Sweden, from June 15 to June 26, 1950, preceding the C.I.G.R.E. Conference.

Further information and registration forms may be obtained from Mr. Frederic Attwood, Chairman, U. S. National Committee of C.I.G.R.E., Room 1781, 50 Church Street, New York 7, N. Y.

P. L. G. Hasskarl

PAUL L. G. HASSKARL, safety engineer for Pennsylvania Power & Light Company's system, died Feb. 2. Employed by PP&L since April 1, 1926, Mr. Hasskarl was previously plant wire chief for Bell Telephone Co. of Pennsylvania.

Widely known for his safety work with the utility firm, he was at one time general chairman of the National Safety Council's public utilities section. At the time of his death he was a member of the American Society of Safety Engineers, chairman of the accident prevention committee of the American Gas Association and a member of similar committees for Edison Electric Institute and the Pennsylvania Electric Association.

Flux or Ring Testing

(*Continued from page* 90)

core will vary with the machine dimensions and the test voltage available. Unless accurate core dimensions and iron characteristics are known and the test coil carefully placed with respect to the core and frame, the large amount of leakage about the frame and end turns makes calculation rather difficult. This leakage is particularly a problem in the case of hydro machines where the diameter of the stator is often quite large with respect to the end to end length of the core laminations.

In such cases it may be necessary to wind the test coil about the core at several points successively around the circumference in order to produce approximately normal flux in the core section in the vicinity of the test coil. If the desired end-to-end voltage of the core is known, together with the voltage of the power supply available for the test, a rough estimate of the number of coil sides needed in the test coil can be made. Increase or decrease in number of test coil turns can then be fairly easily handled.

It is of course obvious that integrity of the lamination insulation is much more important in generators which operate in hydrogen than in air. Machines which operate in air tend to form an oxide film where hot laminations develop and thus are partially self-protecting but this is not true in a hydrogen atmosphere. From what data we have accumulated we are convinced that the flux test is a valuable tool for checking stator cores wherever iron damage is apparent or suspected and that the test might well be considered routine whenever hydrogen-filled machine rotors are removed on periodic overhauls.

Power Requirements of Television Broadcasting As They Affect Electric Power Companies

By Rodney Chipp
DuMont Television Network

Excerpts from a talk before the Transmission and Distribution Committee, EEI, Detroit, Mich., February 21, 1950

FROM the standpoint of power requirements, we may arbitrarily say that there are three major categories into which television broadcasting is divided, namely:

1. Studio plant
2. Transmitter plant
3. Field and relay equipment

Studio Plant

A studio is a point of program origination, containing cameras for pickup of live talent, films, etc., and conversion into electrical signals. A small station may have one film studio only; a medium-sized station may have one film studio and two live studios; and a large station, originating network programs, may have as many as two or three film studios and six or seven live studios and theaters.

Transmitter Plant

The transmitter plant contains the transmitters which convert the electrical visual and aural signals into modulated radio frequency energy, as well as certain necessary test and monitoring equipment. At the present time the majority of metropolitan stations utilize visual transmitters with a peak output of 5 kw and aural transmitters with an output of 2.5 kw. Certain smaller communities use 500-w visual and 250-w aural transmitters.

Field and Relay Equipment

Field and relay equipment includes field cameras with accessory video equipment and portable audio equipment, for the pickup of events such as baseball games, prize fights, etc. In many cases, the aural and visual signals are relayed from the point of pickup to either the studio or the transmitter plant, by means of microwave relay equipment. Similar relay equipment is frequently used for connecting the studio and transmitter, and even for inter-city relaying.

Before considering the power requirements of studio plant, transmitter plant, and field and relay equipment, I should emphasize that these three categories are in a sense arbitrary, and in some cases may not exist in fact. For example, some stations house the transmitter and studios under one roof, and the power requirements are consolidated. However, for purposes of this discussion I trust that such a functional division may clarify the issues.

Studio Requirements

With one or two exceptions, studio equipment operates from a 115-v, single-phase, 60-cycle source. One particular make of projector utilizes 230-v, 3-phase power. Some rear projection equipment has required a d-c arc for a light source, and some older type 35-mm projectors use a d-c arc for a light source.

A single *pickup camera* and associated control equipment utilizes approximately 15 amperes at 115-v. Most studios use three cameras, or a load of approximately 5 kw. Audio equipment adds about one kw, giving a total of 6 kw.

Associated monitors, distribution amplifiers, and switching equipment will, of course, vary with the size of the plant. In small stations such equipment is often located in the single studio control room. In larger stations with several studios, it is usually located in a master control room, the function of which is to handle switching and distribution of visual and aural programs in different studios. For this auxiliary equipment an average of 4 kw per studio is conservative.

Projection Room Equipment

A projection room will vary in size and complexity with size of the station. At WABD in New York, a network origination point, we have two projection studios. The larger contains 35-mm projectors, two 16-mm projectors, two pickup cameras, and miscellaneous slide and opaque projection equipment. The total load runs approximately 25 kw. The smaller room contains one 16-mm projector, one monochrome scanner, one pickup camera, and miscellaneous slide and opaque projection equipment. The total load runs approximately 8 kw. An average station will probably require 15 kw for its projection room.

Studio Lighting

At the present time nearly all television stations are using type 5820 image orthicon tubes in studio cameras. We have found that excellent results are obtained with average studio illumination of 100 to 150 foot candles. Some stations use fluorescent lamps for base lighting, supplemented by incandescent lamps for highlighting or modeling. Others use incandescent lighting entirely. For estimating purposes, a figure of 30 watts per square foot of acting area seems adequate, except in the case of theater studios, where the light sources may be at greater distances from the stage. Assuming an average studio of 30 by 50 feet, any portion of which may be used for action, the installed lighting load will be 45 kw.

TV Rules of Thumb

To summarize studio plant—these rules of thumb may be useful.

Studio Equipment—10 kw per studio. This includes an allowance for master control.

Film Equipment—15 kw per projection room.

Lighting—45 kw for average size studio.

Thus, for an average community station, the studio plant will require of the order of 70 to 75 kw, whereas a large network originating station may require 500 kw.

Air Conditioning and Ventilating

The foregoing figures have not included any power for air cooling or ventilating equipment. You who are in the power field probably think of efficiencies of the order of 90 to 95 per cent. The hypothetical television studio we have just discussed, with an input of some 70

kw, will produce a video signal of 2-v across a 75-ohm load, or about 50 mw. Thus we can see that heat removal is another important use of power in television studios.

In general, voltage regulation should be within 5 per cent, and frequency should be held to 2 per cent. As is the case with much electronic equipment, the built-in power supplies are self-regulated to 0.1 per cent, and the principal thing to be avoided on the primary side is surges. For that reason we attempt to separate the lighting and equipment loads, so that as studio lights are turned on and off, the surges will not result in picture aberrations.

A 3-phase, 4-wire grounded neutral system is to be desired. The form factor of the primary voltage is important in certain applications where half-wave rectifiers are used. Where motors are to be used, induction motors are preferred —brushes tend to create noise in video circuits. Synchronous motors must be used in projectors.

Transmitter Plant Requirements

Basic equipment at the transmitter plant is the main visual transmitter and the main aural transmitter. Under present FCC requirements, most visual transmitters are rated at 5-kw output, with some stations in smaller communities licensed for 500-w output. The aural transmitter is generally half the visual power, or 2.5 kw and 250 watts, respectively. These transmitters require 208-230-v, 3-phase, 60 cycles for operation, and use approximately 32 kva, with power factors from 0.85 to 0.90. In addition, there are units of test and monitoring equipment, speech input equipment, tower lights, sleet melting heaters, etc., which may run the total connected load up to 50 to 60 kva. The permissible power supply variations from the latest revision of the RMA standard on this subject are as follows:

RMA Standard

"For single-phase power supplies the voltage shall at all times under normal conditions be within 5 per cent of the rated voltage.

"For 3-phase power supplies the voltage phase-to-phase shall at all times under no-load conditions be within 2 per cent of the average for the three phases and within 5 per cent of the standard rated voltage.

"The regulation from normal to full load shall not exceed 3 per cent.

"The frequency of the power supply shall be within 2 per cent of the transmitter power supply rated frequency."

Although the transmitters proper use 3-phase, 3-wire, much of the test gear and input amplifiers require 115-v, single phase, so that a portion of the supply should be arranged for 115-v, 3-phase, 4-wire. A year ago when we constructed our Pittsburgh transmitter WDTV, incoming service of 230-v, 3-phase, 3-wire was brought to a distribution panel in the main transmitter room. The general equipment load was distributed through a second panel in the adjacent studio, which was fed from three 7½-kva transformers, 230-115 v, connected to provide 4-wire service.

Most transmitter plants do not have emergency power supplies today. However, most AM transmitter plants have either alternate feeds or their own emergency power supplies and it is likely that television transmitter plants will have such facilities in the future.

Field and Relay Equipment

Many programs today originate from ball parks, prize fight arenas, or even directly on the street. The cameras used to view these events are similar to studio cameras, and the auxiliary equipment is much less extensive. As in the case of studio equipment, we can use 6 kva for a three-camera set up.

In most cases lighting is already available and need not be considered, although we always carry aluminum scoops and photoflood bulbs for supplementary lighting if it is needed, and if all were used it would add another 5 kva. All of this equipment is designed for 115-v, single-phase, 60-cycle operation, and the requirements as to regulation are the same as those of the studio equipment.

Power found in different localities varies, so we carry a power distribution box with mobile unit. A 300-ft cable with No. 6 conductors is used to feed this box, and a link arrangement permits setting it up quickly for 2-wire, single phase; 3-wire, single phase; and 4-wire, 3-phase systems.

Portable generators have been used, but not required for most pickups. When used, regulation has been a problem.

Relays

Relays break down into three subdivisions, dependent upon the use to which the equipment is put. These are:

1. Remote pickup
2. STL
3. Inter-city

Remote pickup relays are one me frequently used to transmit video nals from a point outside of the stu to either the studio or directly to transmitter. STL refers to a st transmitter link, which is a relay or less permanently installed to con the studio to the transmitter, in c where they are separated. For exam our Washington outlet, WTTG, studios in the Hotel Harrington Washington, D. C., and the transmi is located 8 miles away in Arling Va. Inter-city relays are, as the na implies, used to interconnect cities. is reasonably certain that in the fut most inter-city relaying will be hand by the common carriers, as added fa ties for transmitting video signals constructed.

Microwave Relay Frequencies

The radio frequencies used for relay work are known as microwa Most relay, STL, and inter-city re owned by broadcasters operate at 2 or 7000 mc, with powers ranging fr 0.1 watt to 50 watts. The effect powers are considerably greater th this, through the use of reflectors other means to direct the energy in narrow beam toward the receiver. Co mon carrier radio relays likewise ope in this same portion of the radio f quency spectrum, at 4000 and 6000 m

Relay transmitters require from 15 to 1 kw, 115 v, single phase, dependi upon output power. Receivers requi from 200 to 400 w, 115 v, single pha

Summary

To sum up and repeat certain sali points:

1. Studio:
   Typical live studio with three ca eras—55 kw.
   Typical film studio—15 kw.
   With few exceptions all equipme operates from 115 v, 60 cycle
2. Transmitter:
   Typical transmitter plant—50 k
   208-230 v, single phase
   208-230 v, 3 phase
   115 v, single phase
3. Field and Relay:
   3 cameras and associated equi ment—10 kw, 115 v, single pha 60 cycle.

Accident Prevention Committee Meeting

By W. T. Rogers, *Chairman*

THE Accident Prevention Committee held its forty-third meeting on February 9 and 10 at the Shamrock Hotel in Houston, Texas. W. J. Aicklen, vice president and assistant general manager of the Houston Lighting & Power Company, welcomed the 90 members and guests to their first meeting in the southwest.

1949 Accident Experience

H. L. Crisick reported that a sample survey of the 1949 accident experience of 36 companies represented on the Accident Prevention Committee comprising over one-half of the total manhours for the entire industry indicates an 8 per cent reduction in frequency and a 1 per cent increase in severity as compared with 1948. Most disturbing is the 10 per cent increase in the number of fatalities. A summary of this data compared with corresponding data for the same group of companies for the preceding year follows:

	1949	*1948*
Manhours	321,284,291	316,682,748
Fatalities	65	59
Frequency Rate	13.24	14.34
Severity Rate	1.61	1.57

Copies of the analysis of 149 of the 154 fatalities which occurred in the entire industry during 1948 were distributed by D. C. Stewart. Although this represented some improvement over 1947 it is still the second worst record since these annual analyses were initiated in 1941 and the preliminary data for 1949 promises no improvement. Analysis of almost 1000 fatalities during the period 1941 to 1948, inclusive, reveals a surprisingly constant pattern year after year in which about 70 per cent invariably are due to electric shock or burn. Noting that a relatively few unsafe practices account for most of these, Mr. Stewart suggested that all should saturate themselves with the facts from the fatality experience of the industry, select the few outstanding causes, check the adequacy of company practices in protecting against these types of accidents and determine the degree of field compliance.

C. J. Rutland questioned why the fatality pattern is repeated year after year to the point where the number and type of next year's fatalities can be predicted with alarming accuracy when the immediate causes for this repetitive pattern are so clearly evident. He pointed out that responsibility for accidents is shared by the foreman, supervisor, department head, manager and finally the safety director as the specialist in this field who should consider whether job selection procedures are satisfactory, whether safe work practices are firmly established, and whether training is adequate. He emphasized the need for more determined effort to make men understand the reasons for following a prescribed safe procedure and the need for impressing foremen to recognize that condonation of repeated violations of a safe practice establishes an ultimate injury with statistical certainty. He referred to the high degree of discipline associated with hold-off procedures and suggested that the same degree of discipline is needed on all phases of line work.

Publication of four new posters in the Committee's series on industry safety was announced by A. H. Doud. Others are under preparation.

Resuscitation Techniques

W. R. Smith and Dr. W. B. Kouwenhoven of Johns Hopkins University reviewed resuscitation problems and techniques and stressed the need for fundamental research on means for recovering hearts in fibrillation. Each also emphasized the importance of manual resuscitation in view of the critical need for speed in application.

A color movie, "The Breath of Life," made by the Asplundh Tree Expert Company, outlined a "tree-top" resuscitation procedure which is patterned after the pole-top method.

R. E. Phenicie showed the Wisconsin Public Service Corporation sound-slide film, "Paths of Least Resistance," describing the company's present practices in applying grounds for maintenance.

G. MacDonald showed a National Safety Council film, "Easy on the Eyes," which utilizes a new technique to simulate motion pictures at a lower cost.

A considerable portion of the meeting was devoted to round-table discussion conducted by R. P. Douglas. One company reported that it recently has decreed the use of hard hats for all line work while a few others require their use by groundmen. Few failures of newly made cable joints were recalled, however, some companies require workmen to stay out of manholes for a brief period after new joints are energized. Several also prohibit movement of energized cables in manholes. A slipping clutch device to limit permissible loading was suggested as a practical solution to truck derrick failures.

Company Safety Organization

A wide variation in the size of company safety organizations was noted but it was agreed that the size depends on the type of system and its geographical arrangement. Several companies require goggles or spectacles while operating disconnects or air break fuse cutouts and a few require dark lenses. One company has made extensive tests in an effort to devise safe materials and procedures to tie men in while working on tower structures. These showed that the impact loads from only 3-foot falls are sufficient to sever both leather and fabric safety straps attached to safety ropes. Various companies use routine combustible gas tests, carbon monoxide tests, oxygen deficiency tests or combinations of these before entering manholes. Practices vary to some extent according to the conditions likely to be encountered in specific areas. Television antennas, flimsily constructed, located too near power lines and frequently installed with the aid of metal ladders are a considerable problem in one area containing a high concentration of sets. Other companies were urged to begin education of local dealers and servicemen early to help avoid similar problems in their areas.

A second draft of proposed specifications for the purchase of linemen's climbers was submitted for comment by R. H. Coleman.

W. R. Smith outlined the final draft of the report on safeguarding of work areas which outlines principles of marking of safe and unsafe areas, use of barriers, marking tape and watchers and picture examples of typical applications of these principles.

Continued progress in preparation of revised ASA specifications for rubber gloves was reported by I. R. Dohr. New revised ASA specifications for rubber

sleeves, hose, hoods and blankets now have been adopted.

T. R. Claffy of W. H. Salisbury & Company discussed the possibility of coloring ends of line hose red to provide a visual warning when the hose has slipped from belts or hoods. He also described an experimental lightweight rubber sleeve now under limited field test.

C. J. Smith described the street protection standards of the Consolidated Edison Company of N. Y. which have evolved from many years of experience and experiment. Vehicle bodies are painted orange with gray or blue chassis to combine maximum day and night visibility with minimum clashing with other signals and signs in the vicinity. Truck blinkers, flashers, red flags, barricade tapes, guard rails and reflecting signs and tarpaulins are employed in daylight with lanterns, kerosene flares and floodlights added at night. Standard arrangements of these items were outlined for the many types of traffic situations encountered in this area.

The latest Exchange Bulletin edited by G. J. Ruoff described numerous unusual accidents. A steamfitter was scalded while replacing a drain pipe between a boiler and blow-down header when a crew working on an adjacent boiler opened the superheater drain valve allowing a collection of hot water to pass through the blow-down header to the open drain on the first boiler. Oth cases resulted from failure to guide hoist hook clear of an unsecured el vated grating, failure to properly secu old poles subjected to unusual stress careless handling of aluminum arm tape, careless handling of an electri chain saw and sending more than on item at a time up a hand line. Fatalit involved entering a clogged coal bunke working under a suspended transforme operating a truck derrick above the lev of live conductors, failure to engag safety strap snap in D-ring, handling jumper without gloves while it was b ing connected to an energized conduct and seven cases of failure to obser company rubber glove rules.

Electrical Equipment Committee Meeting

B. Van Ness, Jr., *Chairman*

THE Electrical Equipment Committee, with nearly 60 members and guests present, held its 50th meeting at the Netherland Plaza Hotel, Cincinnati, Ohio, on Feb. 13 and 14.

During the evening of Feb. 13, the members of the committee were the guests of the Dayton Power & Light Company for dinner and an inspection tour of the new O. H. Hutchings Station.

Closed Session

In accordance with recent practice, the first day's session was devoted to the closed session discussion of apparatus troubles, system disturbances, and other appropriate subjects of interest primarily to the committee members and utility company guests.

The chairman announced, concerning the F.C.C. Proposal 9288 involving power line carrier, that the F.C.C. had postponed the date of the proposed meeting to review the results of the carrier field strength tests from Jan. 17, to March 21, 1950. The results of 519 field intensity observations are being assembled into a report which contains field intensity curves and the relevant physical data concerning the power lines used for the tests.

W. F. Wetmore reported on the work of the first meeting of the ASA Sectional Committee C-50 assembled to undertake the revision of Standards on Rotating Electrical Machinery held in New York on Jan. 26, 1950. (There was insufficient time at this meeting to consider all of the proposed changes and the work will continue at a later date.)

R. R. Wagstaff presented R. W. Wilbraham's report on recent activities of the EEI-AEIC-NEMA joint committee on power circuit breakers. Mr. Wagstaff also presented for Mr. Wilbraham a series of slides depicting graphically the results of the questionnaire sent out by the Joint Electrical Equipment and Prime Movers Committee on sleeve versus ball bearings for motors in utility service.

Harris Barber reported on the status of the revision of AIEE Standards No. 27.

E. F. Dissmeyer reported on the "Proposed Changes in Transformer Standards—Method of Making Temperature Rise Tests."

Detailed reports by individual members were presented of major cases of equipment and system trouble. These were followed by a round table discussion of the causes and methods of prevention of the cases described.

H. F. Bryans presented for R. M. Pennypacker a paper on Philadelphia Electric Company's experience with compressed air circuit breakers. After prepared and round-table discussion on this subject, the closed session portion of the meeting was concluded.

Operating and Maintenance Division

H. A. P. Langstaff of the West Penn Power Company presented for W. C. Bowen of the West Penn Power Company a report of the meeting of the Storage Battery Subcommittee of the EEI Electrical Equipment Committe held in Buffalo Oct. 27 and 28, 194 Mr. Langstaff also presented M Bowen's report of the meeting held New York on Feb. 3, 1950 of the AS Committee on Storage Batteries for th purpose of revising the present standa ASA-C-40.

Harris Barber of the New Engla Power Service Company presented a interesting paper on "Flux or Ri Testing of A-C Synchronous Machi Armatures." As yet this method checking the condition of machine iro is not widely known or used althoug it is very valuable where it has be employed.

System Engineering Division

"System Planning — Boston Edis Company" was the subject of a stim lating paper presented by E. A Church. Discussion in connection wi this paper seemed to indicate that tran former noise at new stations in reside tial areas is becoming quite a proble and that the decibel rating of the tran former is no indication of the noise i tensity that may be expected and th amount of complaints received from re dents of the area.

S. Goldsmith and W. T. Pavely The Cincinnati Gas & Electric Com pany presented a very interesting pap on "Relaying Difficulties Due to In duced Potentials on Miami Fort-Te minal Transmission Circuits." The di cussion in connection with this pape revealed that several members of th committee have had to resort to stage tests because of the deficiency of mu tual coupling units on present A-C ci culating boards.

Apparatus and Design Division

Walter Morton of the Pennsylvania Power & Light Company presented an unusual and beautifully illustrated paper on the lighting of the Sunbury station. High intensities are employed, and every effort made by warmth of color and uniformity of illumination to make working conditions attractive and comfortable.

E. H. Snyder of Public Service Electric & Gas Company presented for L. Birckhead of Consolidated Gas Electric Light and Power Company of Baltimore an informative paper giving the results of a questionnaire sent to 48 member companies to obtain factual data showing the pattern being followed with respect to the basic design of station service and its supply.

N. C. Pearcy of the Pioneer Service & Engineering Company briefly summarized the comments received from committee members concerning the new Power Station Electrical Data Sheets, and stated that the sheets should be filled out for all major stations going in service after Jan. 1, 1946.

Reid P. Crippen of Ebasco International Corporation very briefly reviewed the action of the AIEE group of the ASME-AIEE Committee taken on Jan. 30, 1950 on "Preferred Standards for Large Turbine Generators."

Utilization Division

B. M. Jones of the Duquesne Light Company presented the first of two papers on "Electric Arc Furnaces and Equipment Producing Heavy Fluctuations." During the discussion following this paper E. F. Dissmeyer of the Commonwealth & Southern Corporation corroborated the data presented in Mr. Jones' paper concerning the required size of the system in short circuit mva for various kva sizes of electric arc furnaces.

Foreign Practice Division

Although not able to be present at the meeting, A. V. DeBeech sent a report on recent developments in Canada and several other foreign countries.

Transmission and Distribution Committee Meeting

By J. E. McCormack, *Chairman*

THE Winter Meeting of the Transmission and Distribution Committee was held on Feb. 20 and 21 at the Hotel Statler in Detroit, Mich., with 180 members and guests in attendance.

Underground Group

The Underground Group sponsored by J. A. Pulsford featured a series of three panel discussions on subjects of current interest. M. W. Ghen, D. C. Hawley, R. E. Morse, F. W. Smith, W. A. DelMar, R. B. McKinley, A. D. Pettee and R. J. Wiseman participated in a discussion of experience with corona-resistant, rubber-insulated, neoprene-jacketed cable conducted by J. A. Pulsford. Most users did not recommend non-shielded cable for underground duct service although some use it up to 5 kv.

E. B. Shew led a discussion by C. O. Carlson, R. H. Hiester, W. B. Kenyon, J. E. McCormack, J. J. Pokorny, J. A. Pulsford, L. G. Smith and W. A. Upham concerning present cable fireproofing practices. A few companies fireproof practically all cables. Others fireproof selectively, depending on the number and importance of cables in the manhole, spacing, short-circuit currents and relay times. Opinion was about evenly divided on the relative merits of concrete and asbestos, the greater cost of asbestos protection being offset by its greater flexibility and ease of application. Several companies now use neoprene tapes to protect against corrosion aggravated by the fireproof covering.

E. L. Leinbach, J. E. McCormack, J. A. Pulsford, E. C. Rue, L. G. Smith and W. S. Wilder discussed practices in the maintenance of underground tanks. This is a minor problem in inland cities where annual inspections with occasional paint retouching suffice. However, some coastal cities with wet vaults experience severe tank corrosion requiring extensive maintenance programs for complete cleaning and refinishing and even tank replacement in some cases.

M. W. Ghen reported that the EEI-NEMA Tentative First Report on Conventional Subway Type Transformers has been completed and will be sent to members for comment prior to the next meeting.

A gadget display sponsored by the Underground Group included models demonstrating some of the novel features of the new pressurized and supervised network system now being installed in Newark; samples of equipment used in installing 120-kv gas-filled, pipe-type cable in Detroit; a gas flow direction indicator for gas-filled cable; hydraulic cable spear; and model 22-kv terminal pole.

Overhead Group

The Overhead Group sponsored by L. G. Smith, covered a variety of subjects.

H. Cole discussed the need for development of uniform sag tables for short span urban construction where it is economical to string conductors to tensions considerably less than the limiting values given in the National Electrical Safety Code and also where it is convenient to use the same sag for the several different types and sizes of conductors frequently placed on the same pole.

J. S. Maloy described an unusually extensive use of aerial survey in selecting the route, purchasing the right-of-way and obtaining the profile for a 62-mile, 132-kv transmission line through the Allegheny Mountains. Mr. Maloy's presentation appears on page 87 of this issue of the BULLETIN.

Overhead Ground Wire Protection

A review of present design practices on 34-46 kv transmission lines presented by F. E. Sanford indicated that about two-thirds of this class of line now being built or planned includes overhead ground wire protection. This protection is not justified in some cases. However, he emphasized that where it is justified, the small incremental cost of a fully coordinated design with reasonably high impulse level also is justified. L. G. Smith outlined standards used by his company and H. E. Stites described laboratory tests conducted to achieve a better balanced design with respect to impulse strength. G. E. Dean described the successful use of protector tubes by his company. G. A. Strohmer noted that causes other than lightning account for the majority of persistent outages in his area. This, together with extensive loops and alternate feeds, makes the added expense for lightning-proof lines questionable.

Conversely, E. V. Sayles pointed out

that the geographical extent of his company's system with resultant radial lines supplying loads at their extremities dictates a high degree of protection against lightning. It was generally agreed that the purpose of the individual transmission lines and the general nature of the system determine the degree of protection required.

Immediately following the first day's session C. L. Matthews of the Matthews Corporation presented a movie showing the use of a truck-mountable, hydraulically operated boom with crow's nest for convenient servicing of overhead facilities. C. J. Beller showed a movie picturing extensive use of numerous kinds of mechanized equipment for speeding both overhead and underground construction.

General Engineering Group

A session on television and its relation to power systems was featured by the General Engineering Group under the sponsorship of J. W. Anderson. W. L. Lawrence of the Radio Corporation of America described television receiver load and its effect on the power system and R. Chipp of the DuMont Television Network discussed the power requirements of television broadcasting. These two presentations are reproduced respectively on pages 91 and 95 of this issue of the BULLETIN. General discussion emphasized the problem of flimsy television antennae located too near power lines. Both manufacturers and utilities were urged to educate local dealers and servicemen to the need for adequate strength and clearance in these installations.

W. C. Phillips reported that there is a considerable delay in the processing of applications for mobile radio installations. Therefore, companies faced with frequency changes were urged to file their applications at once. The Subcommittee on Communications has completed carrier field intensity tests on transmission lines as requested by the FCC.

A session on system troubles was chiefly concerned with the effect of severe sleet storms in the east north central section of the country.

Safe Design, Construction and Operation

The session on safe design, construction and operation, sponsored by C. E. Bathe, featured an address by W. T. Rogers, Chairman of the EEI Accident Prevention Committee. Mr. Rogers stressed the importance of safety considerations in transmission and distribution work since it is here that 85 per cent of the industry's fatalities occur. Although unsafe acts of the individuals are the direct causes of the vast majority of accidents, more foolproof construction will reduce the possibility of these accidents resulting from human failures. Examples include adequate climbing space, adequate space at the pole top for safe placing of feet, location of ground wires, moulding, risers and service pipes where they will not interfere with climbing space, adequate clearance between transmission and distribution arms and convenient positioning of cutouts and arresters.

Mr. Rogers urged provision for engineers to spend some time in operating and maintenance before taking up regular work in engineering and design; that they continually spend some time in the field actually visiting jobs to learn operating problems firsthand; and that they sit in on investigations of major accidents which occur in the line department. In conclusion he pointed out that the safety director can record, analyze, spot troubles, consult with, and advise the line organization and keep safety considerations before the management supervisors and the men. However, the actual practice of safety is the responsibility of all—the workmen, foreman, superintendent and the engineer, designer and operating man.

Standards and Specifications

Activities of the Standards and Specifications Group, sponsored by W. E. Losie, were outlined by subcommittee chairmen.

F. A. Ashbaugh announced publication of TD-90, "Specifications for Douglas Fir Crossarms, Treated or Untreated." Continued progress is being made on proposed specifications for Southern Pine crossarms and it is anticipated that they soon will be sent to members for ballot.

R. M. Havourd reported that minor changes have been incorporated in the proposed EEI-NEMA specifications for suspension, spool and strain insulators to reconcile a few objections expressed on ballots returned by T&D Committee members. NEMA approval of these specifications is pending. It is anticipated that proposed specifications for low- and high-voltage pin and high-voltage post insulators soon will be sent to members for ballot.

E. K. Karcher reported that TD-2 "Specifications for Steel Clevises for Gu Strain Insulators" is ready for publica tion upon release of the specification fo strain insulators. Proposed specification for guy thimbles, guy hooks and strai plates, and pole-top pins are about read to be sent to members for ballot. Re vision of TD-3, "Specifications for La Screws," and the proposed specification for guy clamps still are under study b the Line Hardware Subcommittee. Pro posed specifications for bolt-type stee insulator pins with 1⅜-in. lead thread is ready for review by the subcommittee Future line hardware specifications will refer to the recommendations on standard packaging recently completed by the EEI Purchasing and Stores Committee.

R. J. Palmer announced that the firs five of the proposed series of EEI-NEMA specifications for street lighting equipment now are about ready for publication. These include filament lamps, photometric tests for luminaires, voltage ratings, pendent luminaire mounting and series sockets and receptacles. Good progress is being made on five others and an additional five are planned.

W. L. Vest reported that further work on proposed EEI-NEMA standard characteristics for distribution fuse links is required since manufacturers indicate some difficulty in meeting the 10-second point on the tentative characteristics approved by the T&D Committee.

L. G. Smith outlined a pole testing program proposed by the American Society of Testing Materials to check proposed standard methods of full pole testing, to develop better data on the strength of various species of treated and untreated poles and to establish the relation between the strength of poles and that of small, clear, green specimens.

A Catalog of

EEI Publications

is available upon

request to:

EDISON ELECTRIC INSTITUTE

420 Lexington Ave.

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C. R. Preston

CHARLES R. PRESTON, vice president and member of the Board of Directors of Kansas Gas and Electric Company, died at his home on Feb. 6. He was 57 years of age.

Born in Sparta, Ill., Mr. Preston attended public schools in Oklahoma and studied electrical engineering at Oklahoma A. & M. College. His utility experience began in working after hours in high school and during college vacations. Employed by the Texas Power and Light Company in 1912 as a draftsman, he advanced to resident engineer, supervising construction work. Later he assumed responsibility for inventory and appraisal of new properties being considered for purchase. From 1917 to 1919 he served in the Army Air Corps. Following the war he was employed by the Phoenix Utility Company as an engineering inspector.

In 1920 and 1921 Mr. Preston acted as a consulting engineer for Moses, Pope and Trainer, an engineering firm in New York City. In 1921 he returned to the Phoenix Utility Company on Pennsylvania Power and Light Company operations where he was responsible for the general supervision of construction. In 1924 he was construction superintendent for this company in Phoenix, Ariz.

He was employed by the Florida Power and Light Company in 1925 with duties covering a variety of engineering and commercial work including two years as general sales manager and two years as engineer in charge of company valuation and appraisal in electric rate cases.

Mr. Preston came to Kansas Gas and Electric Company in October, 1937 as a general utility engineer. In October, 1940, he became assistant to the president. He was elected to the Board of Directors of the company in June, 1942. He assumed his present duties as vice president of the company on Jan. 29, 1947, a position he occupied at the time of his death.

Consolidated of Baltimore Reviews Steps Taken in Year-Old Public Information Program

(*Continued from page* 86)

free enterprise were distributed to all visitors. Special comic-book stories on the generation and distribution of electricity and gas were also provided, in the hope that children, too, would come to understand something of the contribution of electric and gas utilities to the American way of life.

Enclosures with dividend checks are used to tell stockholders why and how the campaign is being conducted. The foundation for enlisting the support of the general public is being laid through a program of newspaper advertising.

While it is too early to assess results, Consolidated believes that if facts are presented, employees and others will be able to spot misleading propaganda and half-truths issued by the proponents of socialism. The company is of the opinion that if it can be shown that the movement to nationalize the electric industry is counter to the best interests of employees, stockholders, and the general public, these groups will take affirmative action to prevent such a catastrophe.

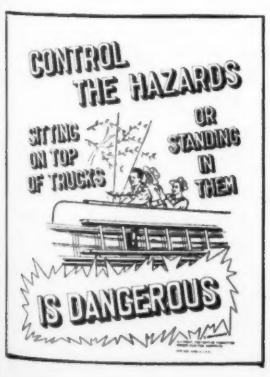
Four More Safety Posters Published by EEI

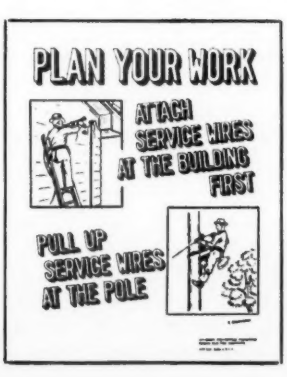
FOUR new accident prevention posters, the latest in the series initiated last year, have been made available by the EEI. Designed specifically for the electric light and power industry, these new posters are aimed at the correction of unsafe driving and the control of hazards in line work.

Each of the 8½ by 11-in. posters illustrates clearly a condition or conditions facing the employee at work that demand the application of the carefully thought-out safety rules lettered prominently on the poster against an eye-catching yellow background. The posters which are sponsored by the Accident Prevention Committee of the Institute, are shown below as line drawings.

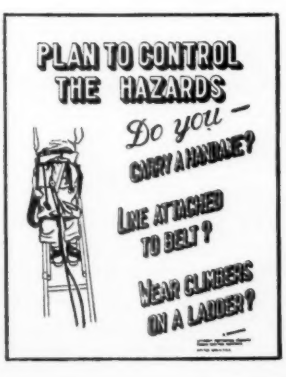
Orders may be made, either singly or as a group, for the posters by the following titles: Control the Hazards (APP 4-50); Plan Your Work (APP 5-50); Defensive Driving is Safe Driving (APP 6-50); Plan to Control the Hazards (APP 7-50). Also available are the first three posters of the series issued last year, titled: Stop, Look, Be Sure (APP 1-49); Be Careful of Cutouts (APP 2-49); and Size Up the Job (APP 3-49).

Each poster may be ordered from the Edison Electric Institute, 420 Lexington Ave., New York 17, N. Y., at the following prices: 1 to 9 copies, 8 cents each; 10 to 99 copies, 5 cents each; and 100 or more copies at 4 cents each.





DEFENSIVE—DRIVING IS SAFE—
USE TIRE CHAINS ON ICE AND SNOW. THEY ARE NO CURE-ALL, BUT WILL HELP THE CAREFUL DRIVER.
YOU MUST SEE DANGER TO AVOID IT. KEEP YOUR WINDSHIELD AND WINDOWS CLEAR OF FOG, FROST, SNOW AND ICE.
KEEP YOUR FEET AND BRAKE PEDAL FREE OF ICE AND SNOW. GET THE "FEEL" OF YOUR BRAKES.



PERSONALS

LOUIS B. ROUND, for the past eighteen years vice president and general manager of Pennsylvania Power Co., has been elected president of the Company. Mr. Round succeeds WALTER H.

MR. ROUND

SAMMIS, who has been elected chairman of the board.

Mr. Round has been affiliated with Pennsylvania Power Co. and its predecessor company since 1907. He was first employed by the Company as a meter reader and two years later was made meter department foreman in New Castle. In 1916 he became superintendent of operations in Ellwood City and in 1917 was made assistant superintendent of operations in the New Castle District. He was appointed district manager in New Castle in 1920 and continued in that position until his election as vice president and general manager on Sept. 1, 1931.

In addition to his office in Pennsylvania Power Co., Mr. Round has been active in many civic affairs in the community and has been prominent in the utility industry in the state. He served Lawrence County as civil works administrator in 1933-34, and was chairman of the Lawrence County Civilian Defense Council during the war. He is a past president and was one of the founders of the Greater New Castle Association. He is a past president of the Lawrence County Council, Boy Scouts of America; and is at the present time a member of the Regional Executive Committee of the Boy Scouts of America. He is also a past president of the Pennsylvania Electric Association.

Mr. Sammis has been president of Pennsylvania Power Co. since 1936. He is also president of Ohio Edison Co., of which Pennsylvania Power Co. is a subsidiary.

DONALD C. LUCE has been elected vice president in charge of combined operations and a director of the Public Service Electric and Gas Co., succeeding the late Jacob T. Barron. Also announced was the election, by the board of directors, of WATSON F. TAIT, JR., to be vice president in charge of electric operation, succeeding Mr. Luce, and the appointment of EDWIN H. SNYDER to be general manager of the company's electric department, the post formerly held by Mr. Tait.

Mr. Luce has been vice president in charge of electric operation since Feb. 1, 1948. For six years prior to that he was general manager of the electric department. He started with the company in 1924 as a cadet engineer, the same year he was graduated from Lehigh University. After various assignments in the electric department of the company, he was made chief engineer at the Kearny Electric Generating Station in 1935, and the following year was promoted to general superintendent of electric generation. He was made general manager of the electric department in 1942.

Mr. Tait has been general manager of the electric department since Feb. 1, 1948, He started with the company as a cadet engineer in 1922. Mr. Tait is a graduate of Marietta College and Lehigh University. Following various assignments in the company's electric generation and distribution departments, he was made assistant general superintendent of electric distribution in 1938 and assistant general manager of the electric department in April of 1942.

Mr. Snyder has been assistant chief engineer of the company's electric engineering department since 1943. He has been with Public Service since 1923 when he started as a cadet engineer in the electric department, a few months after his graduation from Lehigh University. His first assignment was as an engineer in the general office of the company's electric distribution department. In 1937 he was made assistant to the chief engineer in the electric engineering department and six years later assistant chief engineer in that department.

JOHN S. DAVIDSON, manager of the Pennsylvania Power & Light Co.'s Harrisburg division since Sept. 1, 1949, has been appointed a vice president of the company. He succeeds D. A. ELIAS, former Harrisburg division vice president, who retired under the company's retirement program after 26 years of service.

Previous to his transfer to Harrisburg last fall Mr. Davidson had served nine years as head of the Hazleton division. After graduating from Colby College in 1931 he became associated with the Nebraska Power Co., serving successively in that company's power plant and merchandising and commercial sales departments.

In 1937 he joined Pennsylvania Power & Light Co| as assistant in the vice president's office at Allentown and in 1938 was appointed district manager of Allentown district and then advanced to manager of the Hazleton division in 1940.

A. PAUL THOMPSON, cashier of the Central National Bank of Cleveland, has been elected vice president and treasurer of Iowa Power and Light Company.

Mr. Thompson joined the bank as a mail clerk and was promoted through junior executive positions to cashier. He holds degrees in law and public accountancy and is a graduate of the school of banking at Rutgers University.

He is a member of the National Association of Bank Auditors and Comptrollers, National Association of Cost Accountants, and the American Statistical Association.

Three new appointments have been made in the Industrial Sales Department, Duquesne Light Co.

R. R. JOHNSON has been appointed director of Industrial Sales, succeeding R. W. HELLER, who recently became manager of Residential Sales. DAVID W. LOUCKS has been appointed director of Industrial Sales and Steam Sales, and JOHN W. O'NAN, supervisor of Industrial Sales.

A graduate of Ohio State University, Mr. Johnson entered the employ of Duquesne Light in 1925 as an engineer in the Customers' Relations Section. He has since served as supervisor of Customers' Engineering Section, industrial salesman, and supervisor of Industrial Sales.

He is a member of the Engineers' Society of Western Pennsylvania, Association of Iron and Steel Engineers, Electric League of Western Pennsylvania, and Pittsburgh Chamber of Commerce. Mr. Johnson is a registered Professional Engineer in Pennsylvania.

A graduate of Carnegie Institute of Technology, Mr. Loucks joined Duquesne Light in 1926, as a power sales engineer and has since served as power and steam sales engineer, and supervisor of Industrial Electric and Steam Sales. He is president of the National District Heating Association; a member of the Board of Governors, Building Owners and Managers' Association of Pittsburgh, and a member of the Engineers' Society of Western Pennsylvania and Pittsburgh Chamber of Commerce.

Mr. O'Nan returned to the company in December after serving for a year as executive director of the Pittsburgh Industrial Development Council. During this period he was loaned to the Council. He is a member of the Engineers' Society of Western Pennsylvania.

Announcement of two staff promotions in the Hartford Electric Light Company organization has been made by President Austin D. Barney. WILLIAM S. BARKER, purchasing agent, becomes assistant general manager, a newly-created position, to assist executive vice president Kenneth P. Applegate. HAROLD R. SOLER, assistant to Mr. Barker, will succeed him as purchasing agent.

Mr. Barker was graduated from Rensselaer Polytechnic Institute in 1917 as electrical engineer and entered the employ of Hartford Electric Light Co. He has served in the purchasing department as clerk, chief clerk and assistant purchasing agent, and was appointed purchasing agent in 1929.

Mr. Soler was graduated from Rensselaer Polytechnic Institute in 1925 as electrical engineer, and also joined the company following his graduation. He has served in the purchasing department in numerous capacities.

HENRY R. KRUSE, general commercial manager for Puget Sound Power & Light Co., has been appointed manager of the company's southern division at Olympia. He will take over the position left vacant by the recent death of Frank Walsh. Mr. Kruse has been with the company since 1923. He became sales manager of the eastern division at Wenatchee in 1930 and later moved to the northeastern division in Everett. In 1937 he became sales promotion manager for the company and five years later manager of the northern division at Bellingham. Later he headed the economic development and research department at Seattle, becoming general sales manager in 1945 and general commercial manager in 1947.

C. D. OLDS has been appointed superintendent of light and power for the Northern Division of Puget Sound Power and Light Co. at Bellingham, Wash., to succeed A. C. RIGGS, who has retired after 44 years with the company. Mr. Olds, an engineering graduate of the University of Idaho, began work in 1910 at Bellingham as a wireman with the Whatcom County Railway, Light & Power Co., a predecessor of Puget Power. He had been assistant superintendent of light and power for the division since 1930. Mr. Riggs was a general foreman and superintendent of line construction at Seattle before taking the division post in 1925.

F. C. WAGNER, chief engineer of Central Power & Light Co.'s Nueces Bay and Water Street plants in Corpus Christi, Texas, has been named superintendent of power stations in charge of operations and maintenance. L. M. HARTMAN, formerly Mr. Wagner's assistant, is now chief engineer of the two Corpus Christi plants, and T. A. FORD, former chief electrician there, is now assistant to Mr. Hartman. Mr. Wagner joined the company in 1926 and was made chief engineer of the two plants in 1929.

RAYMOND B. MCFARLAND has been named director of the lighting division of Central Maine Power Co., Augusta. He has been with the company since 1938, first as a field lighting engineer in the Rockland and Lewiston areas and then as assistant director.

AARON N. SIMMONS, electrical engineer of power plants of The Detroit Edison Company, has retired after 47 years with the company. His normal retirement was postponed so that he could coordinate the installation of electrical equipment for the new high-pressure section of the Trenton Channel Plant. Mr. Simmons first became associated with the Trenton Channel Plant as plant electrician in 1924. There he helped develop an electrostatic flue dust collector, one of the first such installations in this country. He is a member of the American Institute of Electrical Engineers.

GEORGE A. BEATTY, Canton, O., has been appointed head of the newly formed personnel department of Ohio Power Co. He will be in charge of labor relations, wage and salary administration, employee relations, and the safety program.

WALTER G. HEREN, advertising manager of Union Electric Company of Missouri, has been appointed director of advertising and public relations for the Union Electric System. JAMES W. LUMPP, assistant advertising manager, will succeed Mr. Heren.

JOHN M. COCHRAN has been appointed chief engineer of the Hampden steam plant of Western Massachusetts Electric Co. He joined the company in 1922. RUSSELL D. PURRINGTON, former engineer of steam power and equipment, has been appointed assistant chief engineer of the new West Springfield steam station. He joined the predecessor Turners Falls Power and Electric Company in 1934.

Salesmen, the Backbone of Our Free Enterprise System

(*Continued from page* 70)

gave it the vision of greatness. George Washington of Virginia, with extensive lands along the Ohio, became America's pioneer real estate salesman. Thanks to his salesmanship the destiny of America crossed the Alleghenies.

"After Washington came a steady procession of other pioneers with ideas to sell. Ideas of building great waterways; ideas for trans-continental railways. ideas for airways; ideas for new industries; ideas for vast wealth-creating enterprises; ideas for doing things better.

"For the America we are thinking of is not only a geographical union of states, but also a state of mind. It is that something within each of us that spurs us on to greater accomplishments; that gives us courage and will to do the things we set out to do; that causes us to raise our eyes to the future. That is the spirit of America. It is the spirit that built America. It is the spirit, which if caught and held and put to work, will carry us through to victory."

In *Fortune* magazine in September, 1949, appeared an article titled, "What's

the Matter with American Salesmanship?" This article puts all responsibility for our continued mass production and distribution upon the shoulders of the salesmen of America. I should like to quote two paragraphs from this article:

"The only remaining shortage, and the most serious shortage, is the shortage of creative salesmanship. Until this is corrected, we will continue to be long on many goods.

"The most important educational job ahead of industry, as it retrains its salesmen, is to retrain itself—to cultivate a new spirit of salesmanship permeating all its activities."

I am proud to have had a part in the selling of services offered to the public of San Diego County by the gas and electric industry. I feel today that our industry still offers the greatest opportunity for the betterment of living conditions of the people of our community. We can be proud of the services which you and I sell. There is no other service that lightens the burdens of operating the home or office or business as much as the services which you and I are selling. Let's all be proud of our service to our people and strive to do a better job of creative selling by improving our methods, our appliances and our service. Let's all continue to prove to the people that our free enterprise system is the best of any in the world. By doing this we'll not only raise our own living conditions to higher standards but also those of all our people in this community.

Then we can stand by and say, "I am proud to be a salesman."

Advertisers Set City and Date for Annual Convention

KANSAS CITY will be host to the Public Utilities Advertising Association's National Convention, May 11 and 12, according to President Floyd Fairman of Lexington, Kentucky.

"We greatly appreciate the invitation of the gas and electric companies of Missouri and Kansas," said Mr. Fairman. "With 350 members scattered in almost every state of the union and many foreign countries, selection of this central location will help make the 1950 convention the largest ever held."

The convention program will feature addresses by utility executives, discussion groups, and displays of top utility advertising. Also included will be the famous "Hell-Box" session, an informal gathering for discussing grass roots advertising problems.

CONVENTIONS AND MEETINGS

1950

APRIL

3-5 Annual Conference of Motor Vehicle Operators, AGA-EEI, Hotel Book-Cadillac, Detroit, Mich.
4-6 16th EEI Annual Sales Conference, Edgewater Beach Hotel, Chicago, Ill.
4-7 National Association of Corrosion Engineers, Annual Conference and Exhibition, Jefferson Hotel, St. Louis, Mo.
5-7 Midwest Power Conference, Sherman Hotel, Chicago, Ill.
10-14 American Society of Mechanical Engineers, Spring Meeting, Washington, D. C.
17-19 1950 Conference of Electric and Gas Utility Accountants, Brown Hotel, Louisville, Ky.
17-19 Meter and Service Committee, EEI, Netherlands-Plaza Hotel, Cincinnati, Ohio.
18-19 Indiana Electric Association, Young Men's Utility Conference, Indianapolis, Ind.
19-20 American Institute of Electrical Engineers, Power Conference, Wm. Penn Hotel, Pittsburgh, Pa.
20 Industrial Relations Committee, EEI, Netherlands-Plaza Hotel, Cincinnati, Ohio.
24-25 Pennsylvania Electric Association, Accounting Conference, Benjamin Franklin Hotel, Philadelphia, Pa.
24-26 Purchasing and Stores Committee, EEI, Schroeder Hotel, Milwaukee, Wis.
26-28 American Institute of Electrical Engineers, North East District Meeting, Providence, R. I.
26-28 Northwest Electric Light & Power Association, Engineering & Operation Section, Vancouver Hotel, Vancouver, B. C.
28 Public Information Program, National Meeting, Chicago, Ill.

MAY

1-2 Prime Movers Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.
1-2 Hydraulic Power Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.
1-2 Accident Prevention Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.
1-4 38th Annual Meeting, Chamber of Commerce of the USA, Washington, D. C.
2-3 Pennsylvania Electric Association, Industrial Committee, Bedford Springs, Pa.
2-3 Electrical Equipment Committee, EEI, Edgewater Beach Hotel, Chicago, Ill.
3 Missouri Association of Public Utilities, Joplin, Mo.
4-5 Oklahoma Utilities Association, Biltmore Hotel, Oklahoma City, Okla.
11-12 American Institute of Electrical Engineers, Great Lakes District Meeting, Jackson, Mich.
11-12 Public Utilities Advertising Association Annual Convention, Kansas City, Mo.
15-18 54th Annual Meeting, National Fire Protection Association, Haddon Hall, Atlantic City, N. J.
16 Missouri Valley Electric Association, Annual Meeting, President Hotel, Kansas City, Mo.
23-26 National District Heating Association, Grove Park Inn, Asheville, N. C.
25-26 Transmission and Distribution Committee, EEI, Cosmopolitan Hotel, Denver, Colo.
25-26 Pennsylvania Electric Association, Transmission and Distribution Committee, Alexander Hotel, Hagerstown, Md.
31-June 2 Pacific Coast Electrical Association, Inc., Reno, Nevada.

JUNE

5-7 EDISON ELECTRIC INSTITUTE, Annual Meeting, Atlantic City, N. J.
12-16 National Association of Electrical Distributors, Annual Convention, Atlantic City, N. J.
12-16 American Institute of Electrical Engineers, Summer Meeting, Pasadena, Calif.
15-19 Canadian Electrical Association, 60th Annual Convention, Manoir Richelieu, Murray Bay, Que., Canada.
19-21 American Society of Heating & Ventilating Engineers, Semi-annual Meeting, Muskoka Lakes, Ontario, Can.
19-23 American Society of Mechanical Engineers, Semi-Annual Meeting, St. Louis, Mo.
26-30 American Society for Testing Materials, Atlantic City, N. J.

AUGUST

21-25 Illuminating Engineering Society National Technical Conference, Hotel Huntington, Pasadena, Calif.

SEPTEMBER

25-27 American Trade Association Executives Annual Meeting, Somerset Hotel, Boston, Mass.
27-29 Canadian Electrical Manufacturers Association Annual Meeting, General Brock Hotel, Niagara Falls, Ontario, Can.

OCTOBER

2-6 American Gas Association Annual Convention, Atlantic City, N. J.
3-5 American Institute of Electrical Engineers, Publicity Committee Meeting, District No. 2, Baltimore, Md.
11-14 International Association of Electrical Leagues, 15th Annual Conference, Copley Plaza Hotel, Boston, Mass.
16-20 38th National Safety Congress, Chicago, Ill.

NOVEMBER

8-10 Wisconsin Utilities Association, Electric and Gas Section, Schroeder Hotel, Milwaukee, Wisc.
13-16 National Electrical Manufacturers Association, Chalfonte-Haddon Hall, Atlantic City, N. J.
27-29 American Standards Association Annual Meeting, Waldorf-Astoria Hotel, New York, N. Y.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

OFFICERS

ELMER L. LINDSETH, *President*.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
L. V. SUTTON, *Vice-President*.....Carolina Power & Light Co., Raleigh, N. C.
H. S. BENNION, *Vice-President and Managing Director*...420 Lexington Avenue, New York, N. Y.
K. B. CRUMB, *Treasurer*.....American Gas & Electric Service Corp., New York N. Y.
MAE B. WOODS, *Secretary*.....420 Lexington Avenue, New York, N. Y.

BOARD OF DIRECTORS

(Terms Expiring 1950)

E. R. ACKER.....Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.
AUSTIN D. BARNEY.....The Hartford Electric Light Co., Hartford, Conn.
REX I. BROWN.....Mississippi Power & Light Co., Jackson, Miss.
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L. M. KLAUBER.....San Diego Gas & Electric Co., San Diego, Calif.
J. A. LONGLEY.....Central Illinois Light Co., Peoria, Ill.
H. B. MUNSELL.....Kansas City Power & Light Co., Kansas City, Mo.
R. S. NELSON.....Gulf States Utilities Co., Beaumont, Texas
C. E. OAKES.....Pennsylvania Power & Light Co., Allentown, Pa.
B. F. PICKARD.....Interstate Power Co., Dubuque, Iowa
McGREGOR SMITH.....Florida Power & Light Co., Miami, Fla.
A. C. SPURR.....Monongahela Power Co., Fairmont, W. Va.
L. V. SUTTON.....Carolina Power & Light Co., Raleigh, N. C.
O. TITUS.....Metropolitan Edison Co., Reading, Pa.

(Terms Expiring 1951)

J. M. BARRY.....Alabama Power Co., Birmingham, Ala.
GEORGE M. GADSBY.....Utah Power and Light Co., Salt Lake City, Utah
D. E. KARN.....Consumers Power Co., Jackson, Mich.
J. E. LOISEAU.....Public Service Co. of Colorado, Denver, Colo.
PAUL B. McKEE.....Pacific Power and Light Co., Portland, Ore.
C. B. McMANUS.....Georgia Power Co., Atlanta, Ga.
S. C. McMEEKIN.....South Carolina Electric & Gas Co., Columbia, S. C.
GROVER C. NEFF.....Wisconsin Power and Light Co., Madison, Wis.
P. H. POWERS.....West Penn Power Co., Pittsburgh, Pa.
HAROLD QUINTON.....Southern California Edison Co., Los Angeles, Calif.
J. B. THOMAS.....Texas Electric Service Co., Ft. Worth, Texas
JOHN T. WARD.....Boston Edison Co., Boston, Mass.
W. F. WYMAN.....Central Maine Power Co., Augusta, Maine

(Terms Expiring 1952)

W. C. BECKJORD.....The Cincinnati Gas & Electric Co., Cincinnati, Ohio
H. B. BRYANS.....Philadelphia Electric Co., Philadelphia, Pa.
H. C. CUMMINS.....Northern States Power Co., Minneapolis, Minn.
CHAS. B. DELAFIELD.....Consolidated Edison Co. of New York, Inc., New York, N. Y.
W. G. B. EULER.....Pacific Gas and Electric Co., San Francisco, Calif.
F. C. KELLOGG.....Pioneer Service and Engineering Co., Chicago, Ill.
C. E. KOHLHEPP.....Wisconsin Public Service Corp., Milwaukee, Wis.
P. H. McCANCE.....Duquesne Light Co., Pittsburgh, Pa.
R. E. MOODY.....Union Electric Company of Missouri, St. Louis, Mo.
IRWIN L. MOORE.....New England Electric System, Boston, Mass.
A. T. O'NEILL.....Buffalo Niagara Electric Corp., Buffalo, N. Y.
HAROLD TURNER.....The Ohio Power Co., Canton, Ohio
G. W. VAN DERZEE.....Wisconsin Electric Power Co., Milwaukee, Wis.
FRANK M. WILKES.....Southwestern Gas & Electric Co., Shreveport, La.

Executive Committee

The Executive Committee consists of the following members of the Board of Directors: Austin D. Barney, W. C. Beckjord, H. B. Bryans, Chas. B. Delafield, P. H. McCance, Chas. E. Oakes, P. H. Powers, O. Titus, J. T. Ward.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

(Continued)

ADVISORY COMMITTEE 1949-1950

D. C. BARNES.....Virginia Electric & Power Co., Charlottesville, Va.
E. F. BARRETT..Long Island Lighting Co., Mineola, N. Y.
S. R. BERTRON.....Houston Lighting & Power Co., Houston, Tex.
J. B. BLACK.....Pacific Gas and Electric Co., San Francisco, Calif.
GEORGE H. BLAKE....Public Service Electric & Gas Co., Newark, N. J.
B. F. BRAHENEY.....Northern States Power Co., Minneapolis, Minn.
PRENTISS BROWN..The Detroit Edison, Co., Detroit, Mich.
CURTIS E. CALDER.....Electric Bond & Share Co., New York, N. Y.
J. W. CARPENTER..Texas Power & Light Co., Dallas, Tex.
H. P. LIVERSIDGE.....Philadelphia Electric Co. Philadelphia, Pa.
EARLE J. MACHOLD.....Niagara Mohawk Power Corp., Syracuse, N. Y.
T. W. MARTIN...Alabama Power Co., Birmingham, Ala.
J. W. MCAFEE.....Union Electric Co. of Miss... St. Louis, M...
W. C. MULLENDORE....Southern California Edison C... Los Angeles, C...
A. B. PATERSON.....New Orleans Public Service I... New Orleans, ...
W. H. SAMMIS.....Ohio Edison Co., Akron, O...
WILLIAM SCHMIDT, JR., Consolidated Gas Electric Light & Power C... Baltimore, M...
PHILIP SPORN...American Gas and Electric Service Co... New York, N...
A. H. KEHOE....Consolidated Edison Co. of N. Y. I... New York, N...
E. S. THOMPSON.....The West Penn Electric C... New York, N...
J. V. TONER.....Boston Edison Co., Boston, M...
J. R. WHITING....Consumers Power Co., Jackson, Mi...
E. A. YATES.....The Southern Co., New York, N...

CHAIRMEN OF EDISON ELECTRIC INSTITUTE COMMITTEES (1949-1950)

ACCOUNTING

Accounting Division Executive, W. H. ZIMMER.....The Cincinnati Gas & Electric Co., Cincinnati, O...
Application of Accounting Principles, H. H. SCAFF.....Ebasco Services Inc., New York, N...
Customer Activities, J. D. ELLIOTT.....The Detroit Edison Co. Detroit, Mi...
Depreciation Accounting, A. E. BAUHAN.....Public Service Electric & Gas Co., Newark, N...
General Accounting, H. S. KING.....Commonwealth Services Inc., New York, N...
Plant Accounting and Records, F. E. DRAPALIK.....Union Electric Co. of Missouri, St. Louis, M...
Taxation, C. J. TRUDEAU.....Wisconsin Electric Power Co., Milwaukee, W...

COMMERCIAL

Commercial Division General, HARRY RESTOFSKI.....West Penn Power Co., Pittsburgh, ...
Sales Personnel and Training, E. O. GEORGE.....The Detroit Edison Co., Detroit, Mi...
Wiring and Specifications, F. E. DAVIS.....Commonwealth Services Inc., Jackson, Mi...
Commercial Sales Section, C. A. STEVENS.....Public Service Electric & Gas Co., Newark, N...
Farm Section, J. C. CAHILL.....The Detroit Edison Co., Detroit, Mi...
Industrial Power and Heating Section, R. G. ELY.....Public Service Electric & Gas Co., Newark, N...
Residential Section, H. A. STROUD.....Monongahela Power Co., Fairmont, W. ...

ENGINEERING

Engineering Division General, E. W. DILLARD.....New England Power Service Co., Boston, M...
Electrical Equipment, B. VAN NESS, JR.....Pennsylvania Water & Power Co., Baltimore, M...
Hydraulic Power, G. J. VENCILL.....Union Electric Co. of Missouri, St. Louis, M...
Meter and Service, H. A. BROWN.....Rochester Gas & Electric Corp., Rochester, N...
Prime Movers, F. P. FAIRCHILD.....Public Service Electric & Gas Co., Newark, N...
Transmission and Distribution, J. E. MCCORMACK.....Consolidated Edison Co. of New York, Inc., New York, N...

GENERAL

Accident Prevention, W. T. ROGERS.....Ebasco Services Inc., New York, N...
Codes and Standards, J. T. BARRON.....Public Service Electric & Gas Co., Newark, N...
Electric Power Survey, WALKER L. CISLER.....The Detroit Edison Co., Detroit, Mi...
Financing and Investor Relations, C. E. OAKES.....Pennsylvania Power & Light Co., Allentown, ...
Industrial Relations, S. F. LEAHY.....The Detroit Edison Co., Detroit, Mi...
Insurance, I. M. CARPENTER.....Ebasco Services Inc., New York, N...
Membership, E. S. THOMPSON.....The West Penn Electric Co., Inc., New York, N...
Prize Awards, G. E. WHITWELL.....Philadelphia Electric Co., Philadelphia, ...
Purchasing and Stores, R. P. SNOW.....The Cleveland Electric Illuminating Co., Cleveland, O...
Rate Research, S. W. ANDREWS.....American Gas & Electric Service Corp., New York, N...
Rural and Urban Development, GEORGE R. KEEGAN.....Western Massachusetts Electric Co., Springfield, M...
Statistical, O. E. SMITH.....Consolidated Gas Electric Light & Power Co., Baltimore, M...
Transportation, LINN EDSALL.....Philadelphia Electric Co., Philadelphia, ...

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